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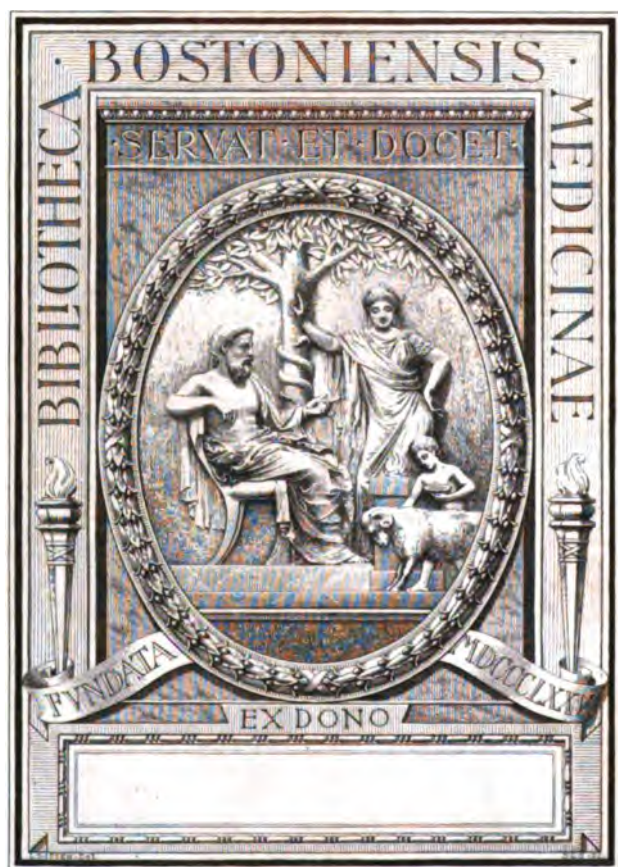
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**JOURNAL**  
OF THE ASSOCIATION OF  
**MILITARY**  
**SURGEONS**  
OF THE UNITED STATES.

EDITED BY

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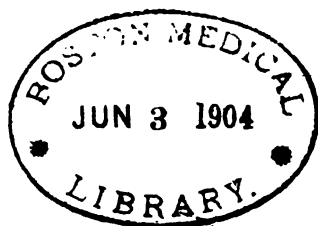
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VOLUME XIV.

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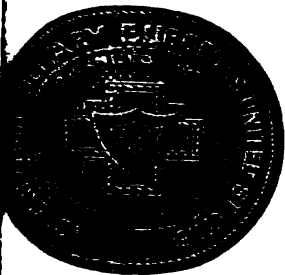
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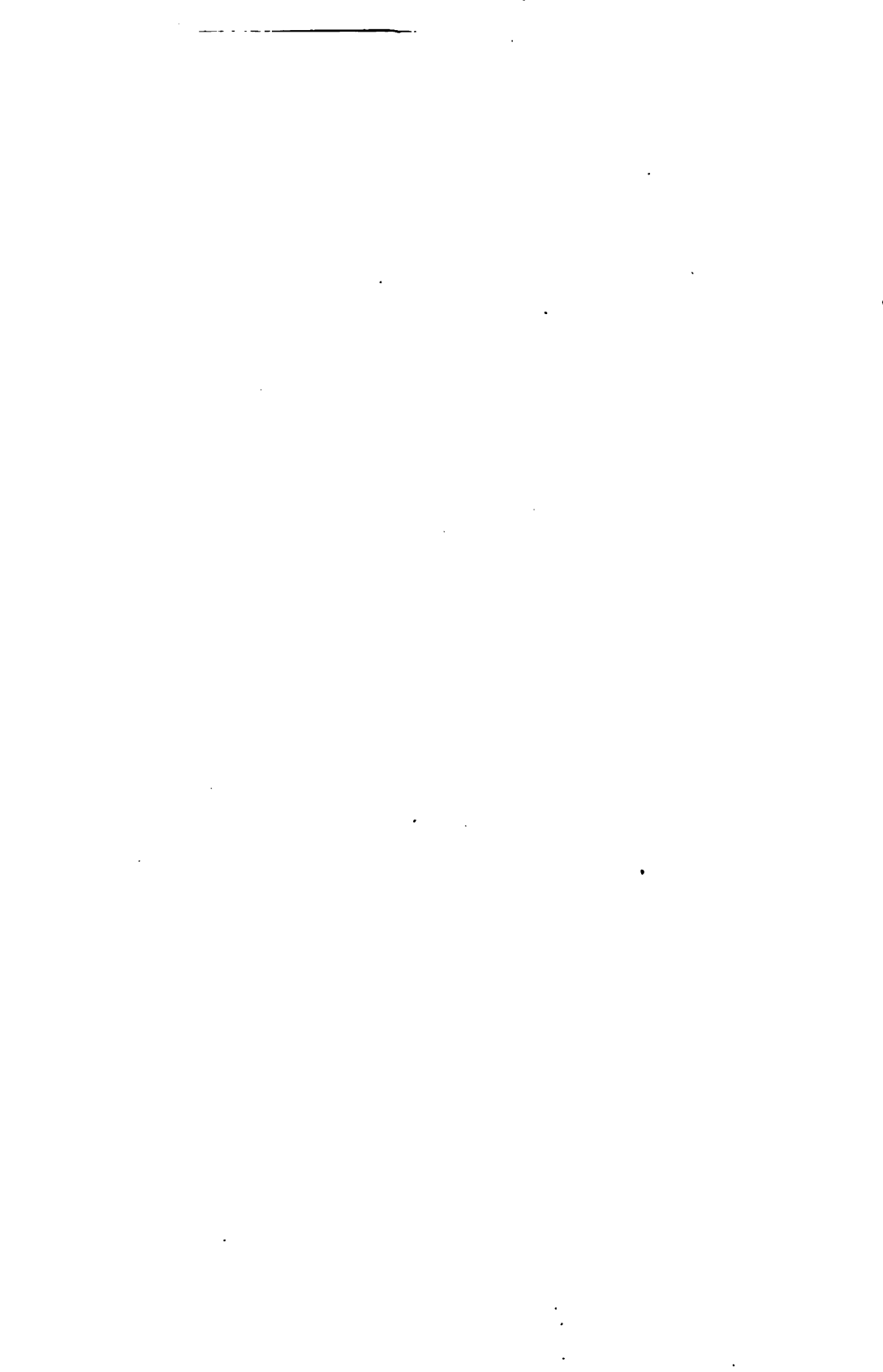
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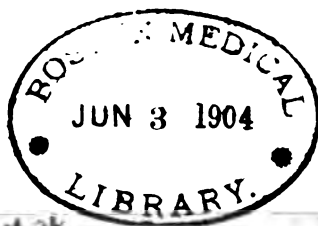
Very faithfully yours,

*James Evelyn Filcher*









*"Its Situation is Picturesque."*

## SANITARY SERVICE IN SURIGAO, A FILIPINO TOWN IN THE ISLAND OF MINDANAO.\*

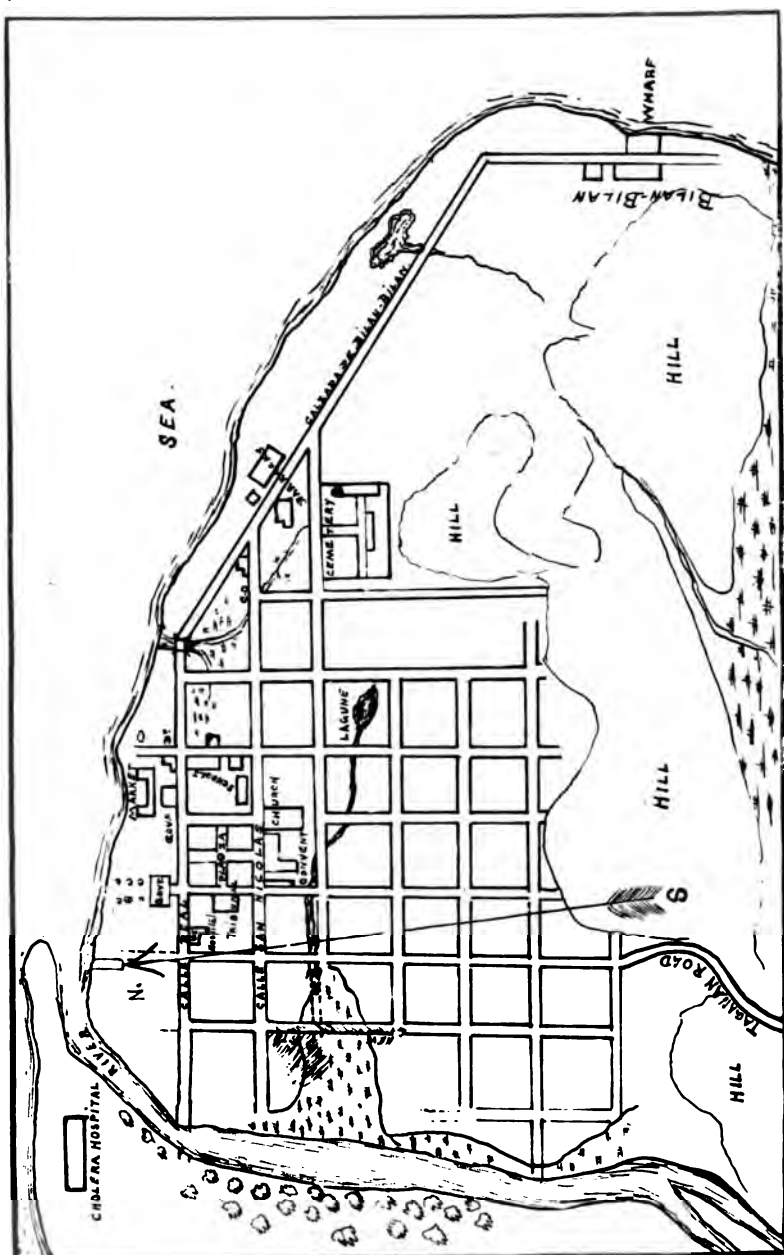
BY CAPTAIN HENRY DU REST PHELAN,  
SAN FRANCISCO, CALIFORNIA.

RECENTLY ASSISTANT SURGEON OF UNITED STATES VOLUNTEERS  
AND PRESIDENT OF THE MUNICIPAL BOARD OF HEALTH  
OF SURIGAO, MINDANAO.

ON or about May 1st, 1902, I received from the Commanding officer, Post of Surigao, for compliance therewith, a copy of General Orders No. 66, Headquarters, Division of the Philippines, Manila, P. I., March 25, 1902. In virtue of this order, directing Medical Officers of the U. S. Army to take charge of the sanitation of the towns in which they are detached, I called for a meeting of the Provincial Board of Health, in order to impart this information to its members. The Provincial Board

\*An official report on sanitary conditions in the town of Surigao, Mindanao, published by permission of the Surgeon General of the Army.

ENDORSEMENT OF THE CHIEF SURGEON, DIVISION OF THE PHILIPPINES, IN FORWARDING THIS REPORT TO THE SURGEON GENERAL OF THE ARMY: "This report is recommended to all as good reading. As a minute and accurate description of life in a Philippine Village, this report deserves a permanent place in literature. If consonant with the customs of the service, it is recommended that it be given to the Secretary of the Association of Military Surgeons for publication in the JOURNAL of that institution."



Plan of the town of Surigao.

of Health consists of one Filipino medical man, one American and one Filipino civilian, whose duties are defined in statute No. 308, of the Civil Government of the Philippines, approved December 2, 1901. Upon appearing before this Board, I read a translation of General Orders No. 66, and declared that henceforth, and until further orders, I was to have full control of the sanitation of Surigao, where no Municipal Board of Health was



**"The Center of the Town is at the Plaza."**

as yet existant. In company with the members of the Provincial Board, I made a thorough house to house inspection of the entire town, and noted the improvements to be required. I immediately afterward undertook to realize the object I had in view, and labored thenceforth day after day for two months, with a certain degree of success.

The town of Surigao, which claims with its Barrios, 10,400 inhabitants, lies stretched along the ocean shore, extending from the Surigao river to Bilang-Bilang in one direction, and to the foot-hills in the other. The total length of the settlement is about one mile by  $\frac{1}{4}$  mile. Its situation is picturesque and it requires the expenditure of but a small amount of labor and money to make it a most charming and delightful spot. The soil is sandy and the surface low and level. At high tide, the sea water

risers in many of the streets, some of which are completely flooded thereby. The drainage is entirely of the surface variety, and is provided for by a good but incomplete system of canalization constructed in former years. Many of the houses are built on piles over tide water land along the river bank. The centre of the



**"At High Tide the Sea Water Rises in Many of the Streets."**

town is at the plaza, around which are to be seen on one side, the Church and Convent, on the opposite, the Casa Real, seat of the Provincial Government; on another side, the Tribunal, seat of the municipal government, opposite which are the two public schools for boys and girls, and the Weather Bureau. To the west of the plaza is the business section of the town, extending therefrom to the river, most of the stores being kept by Chinese. The U.S. Military Hospital is in the rear of the Tribunal, facing the sea, in a most excellent location.

The barracks of the American garrison are situated on the seashore, fronting on the Calzada de Bilang-Bilang, a beautiful avenue of trees leading from the district of the same name, the landing place of all large vessels, to the town proper. A short distance above the barracks, the Galzada bifurcates; that to the right, Calle Real, follows the beach and passes on one side of the plaza, in front of the Casa Real and U. S. Military Hospital, to the river, where it terminates. The other, Calle San Nicolas, runs a short distance from the sea at a divergent angle and passes

in front of the church, through the business portion of the town to the river where it also terminates. This latter street is more thickly settled than the other. There are six cross streets running from the beach to the foot hills, most of them being sparsely settled except in the business portion of the town.

At the time I assumed the duties of Health Officer, the sanitary condition of Surigao was bad. I found the streets mostly overgrown with grass and weeds, the vacant lots studded with abandoned poles, ruins of former shacks, and rubbish of all sorts, while everywhere there were carabao wallows and other pools of stagnant water, where the amphibious Filipino motive power lies



**Plaza, Governor's Residence to the Left, Girl's School to the Right, Captain Phelan's Quarters to the Center.**

dormant the greater part of the time, sunken up to his nostrils in the muddy water. The two or three main canals were obstructed and almost useless. A feeble attempt had been made by the inhabitants to dig ditches or gutters around their dwellings. These were, however, of little service as their depth varied with the whim of the digger and were often inclined in wrong direction and disconnected, thus defeating the very purpose for which they had been ordered constructed, and exemplifying to a marked degree the lack of intelligence displayed by the average Filipino in his work. He almost invariably, when digging a ditch, piles the

dirt on the outer edge of the same, thus preventing the water to drain from the road into the ditches. The ground underneath the houses was invariably covered with filth of all kinds, human excrement included, and often showed pools of stagnating malodorous water.

Roaming at will over the town, was a herd of swine, mostly sows, the like of which could be duplicated nowhere in regard to emaciation, some of them being scarcely able to get about, so weak they appeared to be. Many of these poor creatures were followed in their peregrinations by a numerous progeny which, receiving no nourishment from their decrepid ancestor, fed as well as the parent swine on human excrement. I was unable to



**Casa Real, — Seat of the Provincial Government.**

find any Filipino hogs that were fed by their owners, save those kept by the Chinese, which remained in pens and were fattened for the market

The dog nuisance was also to be contended with. Not unlike the swine, they appeared to be thrown upon their own resources for the necessities of life. Thus emboldened by starvation, they roamed about the town, keeping company with the swine in their frequent visits underneath the houses, and too often made incursions into the kitchens and stole everything that they could digest. Worst of all they made night hideous by their incessant howling.

The obstructed canals, the unscientifically dug ditches and gutters on the road side, the low lying lands and flat roads, caused in the rainy weather, water to stagnate everywhere, compelling the passer by, even in the main street to walk ankle deep in muddy water, when going about his business.

Aside from the Chinese stores located on the few streets adjoining the river, there were no places of business of a retail nature except the Tiendas or small shops, which were to be found everywhere, all more or less filthy. The tiendas are either located underneath houses, or occupy the front portion of small shacks built on the roadside. In front of each there is invariably



**"The U. S. Military Hospital is in the Rear Facing the Sea."**

a platform about two feet from the ground, which usually serves as a lounging place for idlers of both sexes, and as a playground for the hordes of naked children found in every household. Just back of the platform there are a few rows of shelves upon which may be seen some tin cans and jars containing various comestibles, a basket or two of dried fish, a jug of tuba or vino, a bunch of bananas suspended by a string, a smoky tin lamp, while at certain hours of the day the scene is enlivened by the keeper of the tienda, usually a cocoanut-oil-lubricated female, busily engaged in scrutinizing the hair of a neighbor in search of a too commonly

found guest. To any but a Filipino, these Tiendas are a disgusting source of food supply, and in a time of epidemics, would be a menace to the health of the community.

The food stuffs consumed by the inhabitants of Surigao consist mostly of dried fish, bananas, bread fruit, rice and several nameless articles. During the present visit of locusts which are now swarming by myriads over this town, the menu is improved by these winged visitors which the children catch in nets and eat roasted as a delicacy. Occasionally fresh beef is to be had, but it is too costly for the average house wife, the price being 15 cents, gold, per pound.



**"The Amphibious Motive Power."**

The water supply is poor. In almost every vacant lot there is a well. This may be either round or square, deep or shallow, usually the latter. The round ones consist mostly of a hollowed trunk of a tree sunk into the ground. As a rule these wells adjoin a carabao wallow, and are the bathing places of the neighbors, and the rendezvous of the washerwomen who cleanse their linen alongside the well, unmindful of the fact that the sandy soil permits the soapy water they employ to flow back into the well again. From these holes the natives derive all their drinking water, which they usually transport home in hollowed bamboo poles about ten feet in length. The more advanced make use of



American coal oil cans which they eagerly seek from the soldiers. It is a wonder indeed that more sickness is not propagated, considering the dangerous water supply of the town. Since, up to three months ago, or thereabouts, there was no physician in Surigao, save the Army Medical Officer, the report of vital statistics is necessarily unreliable. *Mediquillos* or Medicine Men, a gentry who are usually more ignorant than wise as regards matters medical, cared for the sick natives. The methods employed by these gentlemen of the profession and the results obtained are



**Types of Surigao Residents and a Tienda or Shop.**

worthy of a separate report, and will not be touched upon in this paper.

During the month of April, 1902, the total number of deaths reported was as follows: Children, male, 6, children, female, 2, total 8; adults male, 6, female, 3, total 9, giving a grand total of 17 deaths in one month out of a population of over 3,000 within the town limits. Of these deaths the following causes were given: Beriberi and *Calenturae*, the latter being a convenient diagnosis explaining every death of unknown causation.

Upon taking charge of the Health Department of Surigao, my first duty was to compel every inhabitant to thoroughly police the vicinity of his dwelling and to properly drain it. Ditches were then ordered dug along all the streets and roads, all pools of stagnating water were given an outlet into one of the main canals. Vacant lots, street crossings and marsh lands received my special attention. I set a gang of a score or more of native prisoners to work under my direction, and saw that their work was properly performed, I was ably assisted in this by Acting Hospital Steward Logan M. Gilbert, U. S. Army, to whose untiring zeal and attention, Surigao owes much of its improved



**"Ditches were Ordered Dug all Along the Streets."**

sanitary condition of to-day. Upon the departure of Steward Gilbert for the United States, after six weeks of faithful uncompensated work, Private Lonnie Bamer, of the Hospital Corps, succeeded to his position of Sanitary Inspector, in which capacity he is performing most efficient work.

In a short time, the roads were clean, the marshes drained, the houses purified, and the inhabitants impressed with the necessity of adopting new rules of hygiene.

They all went to work with a pseudo-enthusiasm, founded less on a desire to adopt civilized ideas and methods, than on a fear of the penalties that they would incur by failing to comply

with my directions. It was a novel sight indeed to see every one, old men, women, and even little children, actively engaged all over the town, in removing the accumulated rubbish from about their premises, and, squatting upon their heels in true Filipino fashion, to uproot each individual blade of grass in their vicinity, with a small knife or a bolo. Some even went so far as to take advantage of the moonlight nights to continue the good work. To these I never spared words of praise and encouragement.

The swine also claimed my attention. These were placed under the ban, and after being roundly denounced by me for



**"The Only Available Means Were a Few Carabao Carts."**

their filthy habits and disease spreading capacity, were ordered removed from the town or killed. The police were entrusted with the care of these wandering quadrupeds, and it was a sight to see these important officials going about town, armed with a long bamboo pole with a noose attached to one end, in quest of a roaming pig. No sooner was one discovered and caught than the whole neighborhood was apprised of the fact by the captive himself, and soon after, a couple of policemen could be seen dragging by a rope attached to its foreleg, a hapless pig, while another policeman brought up on the rear, striking the prostrate animal all the way.

The Filipinos have as yet failed to solve the problem of coaxing a pig to go where he is wanted, so they invariably attach a rope to a foreleg, with the result that the pig falls to the ground and is unmercifully dragged over the stones all the way to the Tribunal, where he is incarcerated with his biped countrymen. He usually arrives at his destination in a pitiful state, especially, as it has happened, when he hails from Bilang-Bilang, one mile distant.

The dog nuisance was also abated to a certain extent. At first these marauders were shot wherever encountered, and to their wonderful vitality, Surigao owes to-day its large number of



**Building a Street Through an Impassable Neighborhood**

canine cripples. I have seen one pierced by three bullets, walk off apparently unconcerned. Others shot through the neck and elsewhere, would escape and survive. The shooting process was finally abandoned as being a menace to the community and harmless to the dogs, and for some time thereafter, the unmolested curs reappeared in force. It was then decreed that all dogs unprovided with a license tag, costing  $\frac{1}{2}$  peso, should perish. The method of carrying out the execution not having been specified, the police applied to the Military Hospital for a means to the end, and one of the Privates of the Hospital Corps having furnished the executioner with a spear, the latter went forth armed

with this antiquated weapon which caused many a Surigao cur to bite the dust.

The condition of the Cemetery was next investigated. This dismal place, which is not a great distance from the Barracks, is constantly locked, save when a funeral is taking place. It was therefore, necessary for me to scale the wall in order to carry out the proposed investigation.

The Surigao cemetery is a square enclosure surrounded by a stone wall, and provided with one entrance closed by a high



**Sanitary Representatives of the United States in Surigao.**

wooden gate. An avenue leads from this gate to the center of the enclosure where it terminates in another avenue which crosses it at right angles and extends from one side of the place to the other. Both these avenues are shaded by beautiful trees. At the point of junction of the two avenues, and facing the gate, is a Pantheon, a heavy piece of masonry in which are three tiers of oven-like holes intended to receive each a body, after which the

entrance is sealed and ornamented with a marble slab suitably inscribed. At the end of the avenue leading to the left is another similar structure. The remainder of the cemetery is devoted to burial plots alone.

The cemetery appeared to be overcrowded, so much so that bodies were being buried in the roadway itself. It was moreover, in a shameful state of neglect, being absolutely overgrown with weeds and grass, six feet high or more.

Scattered about the ground, were everywhere, to be seen bones and other fragments of human bodies. Here a skull, there an entire scalp with the hair still attached, further, remnants of clothing and of shoes, and even several coffins of children still intact, showing that they had remained but a short time underground. In one of the niches of the Pantheon, a dozen or more skulls lie in a heap, gazing with a blank stare at me as I proceeded on my tour of investigation. Further on, I stumbled over another heap of gruesome remains of former residents of Surigao.

This wholesale exodus of the dead from their graves so soon after their demise and so long before the expected trumpet call, could only be explained by me on the ground of scarcity of burial plots. All the places appeared to be occupied, and in order to find a last resting place, the newly deceased must evict some one of those who have gone before him. The natives look upon this process of eviction as quite the proper thing ; while to me, leaving aside the question of sentiment, it appeared quite dangerous to the living to spread broadcast the germ-infected remnants of human bodies. Upon inquiry, I learned that the cemetery was claimed by the Padre. With this potentate I therefore lodged an emphatic protest, and it was only my threat to close his cemetery and to start another in opposition that brought him to terms. The evicted dead once more withdrew under the sod, and the cemetery was made to assume a less gruesome appearance. Perchance I have earned the gratitude of the departed, but the irate Padre has never forgiven me my meddlesome interference with his Campo Santo.

The tide land along the river bank, twice each day covered by water to be exposed again at low tide, exhaled at all times an

unpleasant odor, often accentuated by carcasses of dead animals or refuse which the receding water left high and dry. In spite of these disagreeable features, the natives unhesitatingly constructed dwellings above this tide land, being often compelled to use a boat to reach the bamboo ladder leading to their front door.

As it was not practicable to expropriate all these people, I set to work to fill in this land. The task was a stupendous one, considering that the only available means at hand are several wheelbarrows and a few Carabao carts, each carrying a small load at a snail-like pace. In spite of all my urging and arguing, I have been unable to compel the local Presidente to purchase additional means of transportation, in order to hasten the good work. Hence I have to record to-day the completion of but a small portion of the work mapped out. The most obnoxious lot was cleansed of rubbish and more than half filled in. Others were also improved. But the most useful work performed in this connection was the building of a street through an impassable neighborhood. This required considerable filling in, as much as two feet in some places, and extended over two blocks. I engineered this work through, and propose to open new streets, and to improve the old. On the Plaza and Calzada de Bilang-Bilang, I am to construct stone benches, and will persuade the Municipal Council to give band concerts on the Plaza twice a week, believing that music is conducive to good cheer and the latter to health. By taking this view of the matter alone can I urge it as a sanitary measure.

I next devoted my attention to the Tienda question. Under the present system it would be impracticable to properly inspect all the food stuffs offered for sale, in case Cholera appeared in this town. The necessity for a market was therefore seriously felt. I then gathered together the Principales or prominent citizens and exposing to them my views in this matter, urged them to furnish me with sufficient men and material, promising to build the market myself at no cost to them. I then submitted building plans which I had previously prepared, and argued my case so successfully, that the market is now in course of erection and will satisfy a much felt want.

After laboring thus for a month, and conducting the sanitary work entirely according to my personal views, I became satisfied that a sufficient impetus had been given to the movement to permit me to admit a few Filipinos to take a passive share in it. Heretofore, I feared, not without reason, that they would prove more a hindrance than an assistance to me. I therefore organized a "Junta Municipal de Sanidad," and asserted my authority over the town in sanitary matters in virtue of General Orders No. 66, above quoted, and I told the newly chosen members of the Board that I proposed to make all the innovations and improvements which I enumerated to them, and, upon retiring from the Board, I hoped to leave but little undone that would be for the good of Surigao. The "Junta" recognized me as their leader, and though my methods have at times been necessarily somewhat autocratic, the town council gave me to understand that they thought well of me and of my good intentions in their behalf.

At the close of the second month of incessant work, Surigao finds itself greatly changed in its aspect, and the improvements are still being pushed.

A site for a detention camp was early selected at an isolated and healthful spot across the river. Disinfectants were ordered, and when received, will be employed for the purposes for which required.

The necessary evil, which in this town, is a minor factor, was not overlooked. A standing order of the Post Commander forbids all soldiers to loiter about the tiendas or native shacks. Any one caught disobeying this order or who has become unfit for duty by reason of ills contracted unlawfully, is placed on a blacklist, and suffers a restriction of privileges for a specified time. This measure has had a salutary effect. Still, some have fallen. These are immediately confined to bed in the hospital till recovered, when they go on the blacklist. The women in the same cases are reported by me, arrested and brought to the Tribunal for inspection. If found diseased they remain in confinement till recovered.

While the civilian portion of the population was thus being cared for by the Army Medical Corps, the garrison was not over-



looked. The water supply received early attention. Well water subsequently boiled or distilled was in daily use. Upon the breaking down of the distilling apparatus in April, the Post Commander ordered water transported from a distance across an arm of the bay at Bilang-Bilang, from a spring in the hill side. I personally examined this spring and found the water to be of excellent quality. I then ordered that the surroundings of the spring be cleared, and caused the water to flow over a gravel bed. Before being used, this water is sterilized as an additional precaution. Nearly all the cases of gastro-intestinal disorders which came under my notice since my arrival at this station, in April, 1902, I have found to be due to *Ascarides lumbricoides* or other similar parasites, whose presence cannot be ascribed to the water supply.

The Barracks, which are splendidly located, are in need of but few improvements. The latrines which are built on the beach, over the sea, were enlarged, and the grounds kept thoroughly policed.

The Military Hospital was placed in the best hygienic condition possible. The grounds were cleared of grass and weeds, an extension built to be used as a kitchen, the latrines removed at distance, and other improvements and repairs are now under way.

As a result of this crusade against the filth, carried on in a most efficient manner, one had a right to suppose that the mortality, though low in April, would be lower still in May. Quite the contrary was the case, however, the death list of May being nearly twice that of April. It is not credible that a sudden transition from squalor to cleanliness could have given the community a shock sufficient to cause such a thinning out of its ranks. The diagnosis column of the municipal records of vital statistics confirms this view, for it gives as the cause of deaths: Beriberi, 3; drowned, 1; natural causes, 15; calentura 1; undetermined 8; and as a result of an illness of 8 months (not specified by the Mediquillo in attendance) 1. The ages of the departed varied from one day to ninety years. The deaths were as follows: Children male 9, female 7, total 16; adults, male 9, female 5, total 14, giving a grand total of 30.

In June there was an improvement as follows: Children male 5, female 1, total 6; adults male 7, female 1, total 8, giving a grand total of 14. To this number must be added one adult male American civilian, the first of our countrymen to give up the ghost in Surigao since the occupation of the place by us in March 1900.

In conclusion, let it be said that the utmost harmony reigns between the civil and the military officials at this station, and that all assistance and encouragement have been given to the Medical Officer in the pursuit of his laborious and ungrateful duties.

The natives, though divided among themselves into factions, appear nevertheless to be peaceably inclined toward us, and disposed to obey the laws without questioning them. A few exceptions are to be noted in this connection, but these were only among the Spanish or their mestizos, the friendship of some of whom I have forever lost by urging them to adopt more cleanly habits than they have been accustomed to. Those high in authority have not always set a good example to their followers, notably the Padre, a narrow-minded Spaniard, who stubbornly resists every innovation I seek to introduce into this town, and the Governor of the Province himself, who, no doubt fearing that his family hog might be uncerimoniously dragged through the streets to the Tribunal, if caught wandering near my premises, concealed his pet in a back room of the upper story of his residence, where I subsequently discovered him. This case, however, did not come under any provision of the ordinance which provides a penalty for keeping pigs under the houses, while it makes no reference to their being lodged in an upper room. Such instances, however, are few, for as a whole, the inhabitants of Surigao have displayed more good will than I have found in any community during my long residence in these Islands. Their arch defects seem to be lack of energy, improvidence and inability to administer public affairs. They appear to me like so many children who need a strong hand to lead them in the path they are to follow. Their docility has rendered the task comparatively easy, in so far as I was concerned.

REPORT ON CASES OF MALIGNANT DISEASE OBSERVED AT THE UNITED STATES ARMY GENERAL HOSPITAL AT THE PRESIDIO OF SAN FRANCISCO, CALIFORNIA, 1899-1902.

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IN the following paper fourteen cases of malignant disease observed at the U.S.A. General Hospital, Presido, Cal., will be briefly considered. It is thought that these cases are of enough general interest to put upon record, as in most part they have occurred in young, able bodied men with no family history of malignant disease. The etiology of the cases in almost every instance was some injury to the affected part. The cases described occurred during the period of time between July 1st, 1899, and May 1st, 1902.

Of the fourteen cases eight were due to carcinoma and six to sarcoma. Of the cases of carcinoma, two were operated upon and six were inoperable. Of the six cases of sarcoma, all were operated upon. Both cases of carcinoma in which operation was performed resulted in cure. Of the six cases of sarcoma which were operated upon, five resulted in cure and one case resulted fatally from surgical shock. In considering these cases separately, the cases of sarcoma will first be described.

CASES OF SARCOMA.

CASE 1. *Sarcoma of Mesentery*, Hospital No. 9924. J. A., Private, Hospital Corps. Family history: negative. Previous to operation for sarcoma the patient had been operated upon for appendicitis and hernia. He complained of nausea, severe pain in the right hypochondriac region, and general malaise. Temperature was normal, tongue clean, the bowels somewhat constipated and at times tympanites was present.

The operation for appendicitis was performed two weeks previously, and until the end of that period of time the patient had

been comfortable. He then began to complain of severe pain, paroxysmal in character, and most severe close to the border of the ribs on the right side. The physical signs present were very indefinite, save for tenderness over that region.

Operation: An incision was made just below the border of the ribs on the right side, and some adhesions were found extending across the transverse colon from the omentum, partially constricting the lumen of the bowel. The colon was freed from these adhesions, and as nothing else abnormal was found the wound was closed. The pain still continued, however, and another operation was decided upon. The previous wound was reopened and enlarged, and an examination showed a mass, about 2 c.m. in diameter, hard and indurated, attached to the mesentery of the transverse colon and also very close to the colon itself. It was decided to resect a portion of the colon, in order to remove the growth. This was done, the ends of the intestine being united with a Murphy button. The patient made an uninterrupted recovery, the Murphy button being passed on the tenth day. About three weeks after operation the patient complained of some pain over site of wound which continued, and another operation was performed and adhesions were found around the scar left by the enterectomy. These were liberated and the patient was returned to duty well.

Microscopical Examination: Sections of the growth removed from the abdomen showed it to be a small round-celled sarcoma of malignant type.

CASE 2. *Sarcoma of Popliteal Space.* Hospital No. 7805. C. S. C., Private, 36th Co. Coast Arty. Clinical History: Family history, negative. Patient was never sick before the present illness. Arrived in the Philippines July, 1899, and in January of that year had noticed a small growth in the right popliteal space. It grew gradually larger but did not cause much annoyance until March, 1900, when it had increased considerably in size, was very painful and caused marked edema of the right leg. An operation was performed for its removal on March 26, 1901.

Microscopical Examination: The microscopical examination of this tumor was made in Manila; and it was found to be a cystic sarcoma.

CASE 3. *Sarcoma of Breast.* Hospital No. 8185. J. L., Private, Co. D, 18th Infantry. Age 30 years.

Clinical History: Family history, negative. Patient was in the Philippine Islands eighteen months with the 18th Infantry. While there he had an abscess of the chest, near the left nipple, which was opened in March, 1900, and slowly healed. Soon af-

ter his return to this country he noticed a swelling in this region, which has gradually increased in size for the past ten months. Upon examination a tumor was found involving the left breast, with a softened area containing fluid near its center. The surrounding skin was adherent, and appeared much inflamed. Upon movement, the tumor appeared to be attached to the deep tissues over the ribs.

**Operation :** An operation was performed for the removal of the tumor on the 21st of August, 1901, the tumor being dissected away from the ribs, dissection being carried up into the axilla, where there were some enlarged glands, all of which were removed. The wound was then closed and the patient made an uninterrupted recovery.

**Microscopical Examination :** An examination of sections of this tumor showed it to be a scirrhus sarcoma of the large spindle celled variety.

**CASE 4. *Sarcoma of Testicle.*** Hospital No. 10315. J. G., Sergt., 105th Co. Coast Arty. Age 34 years.

**Clinical History:** Family history, negative. About two months previous to admission the patient was thrown on the pommel of his saddle, striking the left testicle. This began to swell shortly afterwards, and upon admission to the Hospital it was found to be greatly enlarged and indurated, with considerable edema of the scrotum. Upon questioning, the patient gave a history of having repeatedly injured the organ. There was no pain attending the enlargement, and no evidence of acute inflammatory action. The case was diagnosed as one of probable malignant disease of the testicle.

**Operation :** An operation for the removal of the enlarged testicle was performed and a large cystic tumor was found, involving the entire organ.

**Microscopical Examination :** An examination of sections of the diseased testicle showed it to be a cystic sarcoma. It was found to have nearly destroyed the tissue proper of the testicle.

**CASE 5. *Sarcoma of Testicle.*** Hospital No. 11130. D. H., Private Co. H, 3rd Infantry.

**Clinical History:** Family history, negative. Had had malarial fever in Cuba in 1893, and dysentery in the Philippines in 1900. In July, 1901, while on escort duty, he was thrown upon the horn of his saddle, severely bruising the right testicle. The testicle soon began to increase in size, and about October, 1901, considerable softening was detected. He was admitted to this Hospital April 15, 1902. At the time of admission the right tes-

icle was found very much enlarged and there was considerable fluctuation. The patient complained of a dull, aching pain, which was continuous. A diagnosis of sarcoma of the testicle was made.

Operation: An operation was performed for the removal of the testicle April 26, 1902. A large, malignant growth was found, involving the entire testicle, and the testicle was removed. Patient made an uninterrupted recovery.

Microscopical Examination: Upon incising the diseased testicle, a large, cystic tumor was found situated within the parenchyma of the organ, which it had almost entirely destroyed. Sections of this tumor showed it to be a cystic sarcoma.

CASE 6. *Sarcoma of Femur*. Hospital No, 8892. J. W. S. Discharged Soldier. Age 27 years.

Clinical History: Family history, negative. While in Honolulu he noticed a hard tumor situated in the right side, which occasioned considerable pain. Was admitted to the Hospital December 4, 1901. For two months no change was noticed in the size of the tumor, although the patient complained of some pain referred to the region about the knee. The tumor was a hard, irregular, fixed mass attached to the femur at the upper third. The patient's general condition was very good. A diagnosis of osteosarcoma of the femur was made.

Operation: An operation was performed on January 8, 1902, when it was found that it would be necessary to amputate the leg at the hip joint, which was done. The patient suffered very severely from shock, from which he never rallied, death occurring on January 9th, 1902, at 1:40 P. M.

Microscopical Examination: A dissection of the tumor showed that it involved the upper third of the femur up to the surgical neck. Sections of the tumor showed it to be a typical example of osteosarcoma.

#### CASES OF CARCINOMA.

Of the eight cases of carcinoma observed, two were operated upon successfully while six were inoperable.

CASE 1. *Carcinoma of Breast*. Hospital No. 2621. T. J. Y., Private, 23rd Infantry. Age 33 years.

Clinical History: Family history,—One sister died of carcinoma of the breast. Patient was admitted to Hospital November 3rd, 1899. He had noticed a small hard swelling in the right breast near the nipple about six months previously, which had been gradually growing larger. At first there was no pain, but for the past two months there had been some sharp pain at

times. About two weeks previously had noticed a small painful gland in the axilla. An examination after admission showed a hard tumor in the right mammary gland, a little above and external to the nipple about the size of a walnut. It was freely movable over the muscles beneath it, but was attached to the skin and somewhat tender upon pressure. In the right axilla there were several enlarged, tender glands.

Operation: An operation was performed upon December 21st, 1899. The mammary gland was removed and the incision was prolonged to the axilla, where several enlarged glands were found and removed. The wound was then closed. The patient made an uninterrupted recovery.

Microscopical Examination: The tumor was found to be a hard fibrous mass, about 10 c. m. in diameter, presenting upon section a white glistening surface. Sections of the tumor showed it to be a typical scirrhus carcinoma, being composed of a network of fibrous tissue surrounding epithelial cells of malignant character.

CASE 2. *Epithelioma of Jaw*. Hospital No. 8249. G. H., Private, Hospital Corps. Age 28 years.

Clinical History: Family history, negative. Patient had noticed a swelling of the upper jaw just above the incisor teeth which had been present for some weeks. Examination showed an irregular mass about  $\frac{1}{2}$  c. m. in diameter in this region. A diagnosis of epithelioma was made.

Operation: An operation was performed upon September 14th, 1901. The portion of the upper jaw which presented the malignant growth, was removed, and the patient made an uninterrupted recovery.

Microscopical Examination: Sections of this tumor showed to be typical epithelioma of malignant character.

#### INOPERABLE CASES.

CASE 3. *Carcinoma of Larynx*. Hospital No. 4868. P. L. Retired Soldier. Age 64.

Clinical History: Family history, negative. Admitted to this Hospital October 20, 1900. Previous health good. About one year previous had begun to have trouble with the throat, which developed suddenly, an abscess forming in about a week, which was opened and considerable pus found. Since that time the patient had had continuous trouble with the throat, which remained sore and breathing had become difficult. He had considerable cough and a great deal of purulent expectoration. Upon admission, the larynx was found to be slightly enlarged and

swollen, and there was complete aphonia. Breathing was exceedingly difficult, so much so that he was obliged to sit up at night in a chair. This condition increased until death took place January 19, 1901.

Autopsy findings: A dissection made of the larynx revealed the presence of a tumor involving the right lateral and the anterior aspect of the organ. Upon opening the larynx it was found this tumor had caused extensive ulceration of the interior.

Microscopical Examination: Sections made of the tumor showed it to be composed of dense fibrous tissue surrounding irregular areas filled with epithelial cells. Many of these cells were multi-nucleated, and some were pigmented. Structure was that of a scirrhus carcinoma.

CASE 4. *Carcinoma of Bladder.* Hospital No. 10024. W. H. T., Private, Co. "E", 24th Inf. Age 24 years.

Clinical History: Family history, negative. Patient had suffered from malaria in the Philippines seventeen months ago. Was admitted to this Hospital Feb. 17, 1902. While en route to the U. S. he developed a severe pain in the abdomen, which was not localized, constant vomiting and lost strength rapidly. Upon admission he had slight fever and a pulse of poor quality. Complained of general pain over the abdomen. An examination showed the presence of gonorrhea, which had persisted for some time. Physical examination was negative, so far as localized tenderness was concerned, but the abdomen was distended and tympanitic. The patient gradually lost strength and died March 8, 1902.

Autopsy findings: Malignant disease was not suspected in this case, but upon section of the bladder a malignant growth was found involving the entire posterior wall. This portion of the bladder was greatly thickened and the interior covered with ulcerations.

Microscopical Examination: Sections made through the tumor involving the bladder wall showed it to be a carcinoma of the scirrhus type.

CASE 5. *Carcinoma of Omentum, Stomach, Liver, Spleen, Pancreas and Mesenteric Glands.* Hospital No. 8356. H. G., Private, Co. "H," 25th Infantry. Age 35 years.

Clinical History: Family history, negative. Patient was admitted to this Hospital September 18, 1901. On account of the comatose condition of the patient on admission no history could be obtained. The chief symptoms present were marked anemia and emaciation, frequent vomiting and diarrhea. The physical signs were negative, save for the slight tenderness on



pressure over the abdomen. A diagnosis of chronic catarrhal dysentery was made. The patient's strength gradually failed. A persistent hiccough developed. Nourishment could not be retained and death occurred October 3, 1901.

**Autopsy Findings:** Upon opening the abdomen the greater omentum was found to be covered with small pearly nodules and a malignant growth was found involving the omentum, the stomach along the greater curvature and at the pylorus. The intestinal glands were also found involved, as well as the appendix. The liver was found to be invaded by the growth, as well as the spleen and pancreas. The under surface of the diaphragm was also found to be involved.

**Microscopical Examination:** Sections made of the various organs invaded by the malignant growth showed it to be carcinomatous in character, varying in structure according to the organ in which tumors occurred. The primary seat of the malignant process was evidently in the stomach. The sections of the tumor which involved the stomach showed the carcinoma to be of the scirrhus variety, large portions of which had undergone colloid degeneration.

**CASE 6. *Carcinoma of the Liver, Pancreas and Spleen.***  
J. N., Private, Co. "H," 11th Inf. Age 25 years.

**Clinical History:** Family history, negative. Health good until present illness. Patient suffered from ascites in Manila in November 1901. He had been aspirated ten times between October and that date, and twenty to twenty-six pounds of fluid withdrawn at each operation. He was admitted to this Hospital March 31, 1902. Upon admission, there was present general anasarca of the lower extremities, a rapid weak heart, the abdomen greatly distended by fluid and great emaciation. The patient was weak and nourishment was taken with difficulty. His condition changed but little from day to day. He complained continually of sleeplessness and pain due to the abdominal distention. He was aspirated five times between April 5th and April 25th, the quantity of fluid withdrawn varying from 2000 to 10,000 c. c. Upon April 25th the patient appeared very much worse and became comatose. He died on April 16th at 7 P. M. A diagnosis of atrophic cirrhosis of the liver was made.

**Autopsy findings:** Upon opening the abdomen a large malignant growth of the pancreas was found, involving the entire organ. The cut surface of this growth was almost white in color, glistening and of firm consistence. This growth was very closely attached to the intestinal wall but did not invade it. The malignant growth was found to have invaded the liver and also the spleen.

**Microscopical Examination:** Sections of the tumor showed it to be a scirrhus carcinoma.

**CASE 7. *Carcinoma of the Pancreas and Spleen.*** Hospital No. 6863. J. O., Discharged Soldier. Age 24 years.

**Clinical History :** The record of the clinical history in this case could not be obtained. The case was diagnosed as one of miliary tuberculosis.

**Autopsy Findings :** The pancreas was found involved in a malignant growth which had invaded the head of the organ as well as the inferior surface. This malignant process also covered the aorta from the stomach to the bifurcation of the artery, and had also invaded the spleen. Upon section of the growth it presented a hard white glistening surface.

**Microscopical Examination :** An examination of sections of this tumor, microscopically, showed it to be a scirrhus carcinoma of typical structure.

**CASE 8. *Carcinoma of the Greater Omentum, Stomach, Liver, Bladder and Left Kidney.*** Hospital No. 3659. J. M., Retired soldier. Age 54 years.

**Clinical History :** The record of the clinical history in this case could not be obtained. The patient was in the Hospital for some weeks, presenting the clinical symptoms of a malignant process located in the abdomen. There was marked cachexia, persistent vomiting and a gradual failure of strength. The abdomen was distended with fluid, but careful palpation revealed a nodular condition beneath the abdominal wall extending over the entire abdomen. A diagnosis of carcinoma of the omentum was made.

**Autopsy Findings :** Upon opening the abdomen, the greater omentum was found to extend to the bladder, was about 2 c. m. in thickness and involved throughout by malignant growth. This condition was so extreme in the omentum and the fibrous thickening so marked that the entire omentum could be lifted from the abdominal cavity as a solid mass. The malignant growth was also found to involve the stomach, the mesentery, liver, bladder and left kidney. In all these organs sections of the tumor showed a white, glistening surface, typical of scirrhus carcinoma.

**Microscopical Examination :** The microscopic alstructure of the tumor varied somewhat according to its situation, but it was essentially that of a scirrhus carcinoma. A tumor seemed to be oldest in the omentum, and sections taken from different portions in this region presented an alveolar structure. Most of the tumor in the omentum was undergoing marked colloid degeneration. This degeneration was so great in many places that the cellular structure was entirely lost, the sections showing simply fatty and colloid material. In other places a distinct alveolar structure could be made out, fibrous trabeculae enclosing nests and clumps of epithelial cells. Here and there throughout the colloid portions of the tumor, may also be seen epithelial cells, sometimes

collected in small masses, in other places widely separated. The sections were typical of carcinoma.

CASE 9. *Carcinoma of the Intestine.* C. J. S., Discharged Soldier. Age 42 years.

Clinical History: Nationality, German. By occupation a photographer before enlistment. Has served as a soldier fifteen years. Was discharged March, 1902. Arrived in P. I. June, 1898, and returned to the United States July, 1901. While in the Philippines suffered from dysentery for nine months. No family history of malignant disease obtainable. He was admitted to this Hospital May 2nd, 1902. His condition on admission showed marked anemia and a cachetic appearance. He complained of constipation alternating with diarrhea, and pain referred to the lumbar region. A hard movable tumor was discovered in the abdomen, most prominent in the umbilical and left inguinal regions. A diagnosis of probable floating kidney was made and operation decided upon.

Operation: The operation was performed May 26, 1902. An incision was made in the right lumbar region and the tumor forced into the opening. The condition found was that of a hard growth of the hepatic flexure of the colon, with enlargement of the adjacent mesenteric glands, and numerous adhesions to the greater omentum. A resection of the intestine was performed, the gut being united by a Murphy button.

Microscopical Examination: Sections of the tumor showed it to be a scirrhus carcinoma.

From the consideration of the above cases of malignant disease observed at this Hospital the point of greatest practical importance would be the great difficulty of recognizing a malignant process situated within the abdominal cavity. In but one such case was the diagnosis made before death. Another interesting feature is the history of injury which accompanied many of the cases, the site of injury seeming to be the starting place of the malignant process.

As to the etiological factor concerned in the production of malignant disease the microscopical examination of these cases has not aided the theory of a specific micro-organism. While a few of the sections showed bodies which are similar to those described by Plimmer, Gaylord and other investigators, they were not sufficiently numerous or characteristic to lead us to believe in their etiological significance. Similar appearances have been observed in other diseases, especially in the liver, in cases of profound fatty degeneration.

## SPINAL ANÆSTHESIA IN MILITARY SURGERY.

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THE TWELFTH ANNUAL MEETING OF THE ASSOCIATION  
OF MILITARY SURGEONS OF THE UNITED STATES.

THE question of surgical anæsthesia is without doubt one of the most interesting in Military Surgery. The necessity of avoiding pain during the performance of operations has always been a topic of thoughtful consideration on the part of surgeons of all ages. The inhalations of chloroform, ether, etc., were considered as a solution of the problem ; nevertheless, these means require the cooperation of an assistant during their application, they endanger the life of the patient and are not expediently applied.

The military surgeon, especially in times of war, requires an anæsthetic of speedy action, of an inoffensive character and one which the surgeon may be able to carry with him. All these are advantages of great importance when the surgeon finds himself without assistance, a case of common occurrence in campaign service, at which time the number of military surgeons is small as compared with that of the patients.

We will be able to see from the tabulated statistical report I have made of surgical operations effected at the Military Hospital of Instruction of the City of Mexico, that the subarachnoidal injection of hydrochloride of cocaine applied according to the Tuffier process gives the desired results, for the regions where it is applicable.

The manner in which this injection is applied is well known already, therefore, I shall only insist on various modifications made at Mexico's Military Hospital of Instruction and upon several precautions which should be adopted to insure the success of the same.

The latter consist in the selection of the place wherein the in-

jection has to be applied. Therefore, instead of making the injection away from the middle line and introducing the needle obliquely in a forward and inward direction, piercing through the skin, the cellular tissues, the muscles, cartilages and ligaments, it is introduced exactly in the middle line below the spinal apophysis of the third or fourth lumbar vertebrae or even below the second or first. When the injection is applied at this point, the needle has only to penetrate in a perpendicular direction through the skin, the cellular tissues and ligaments directly into the channel through the widest portion of the intervertebral space ; while in making the injection away from the middle line the needle has to penetrate obliquely.

It happens sometimes that the needle gets clogged by the tissues it has to traverse or by the blood from the cellular tissues, and in this case the cephalo-rachidian fluid fails to flow, thus depriving the operator of the evidence that the needle has reached the channel, which evidence he must have before proceeding to the injection. This disadvantage may be avoided by means of a very simple device ; the needle is rapidly introduced through the surface tissues carrying within it a wire mandril, the end of which should not project and which is removed as soon as the operator has reached the canal ; if in spite of this device the cephalo-rachidian fluid fails to flow, it may be extracted by suction with a syringe. The flow of a transparent liquid will show that the needle has reached the vertebral channel.

The patient must maintain a suitable position and the surgeon should first disinfect the lumbar region, his instruments and hands.

As may be seen from the accompanying tabular report, the dose of cocaine employed was 2 centigrammes in 155 cases, 1 centigramme in 3 cases and 5 miligrammes in another case.

In 11 cases out of 210, that is 5%, the anæsthesia was not sufficiently painless to perform the operation and therefore it was necessary to resort to the use of chloroform. In these 11 cases, the dose employed for 9 of them was 2 centigrammes and 15 miligrammes for the other two cases.

In a case of amputation of a leg the anæsthesia lasted one

hour while the operation required 75 minutes, and the employment of 1 centigramme of the anæsthetic.

Out of 210 operations 24 cases, that is 11.42%, were attended by accidents caused by the injection, although not a single one of them had a fatal outcome.

The accidents referred to were, vomiting in 17 cases, (8%), in 11 of which were injected 2 centigrammes and 6 only 15 milligrammes of the anæsthetic; 5 cases (2%) were attended by nausea, 2 of the patients taking 2 centigrammes and 15 milligrammes; acceleration of the pulse in two patients taking 2 centigrammes each; and convulsions were noticed in one case only in which 15 milligrammes were used.

The means to prevent these accidents are :

1. Complete sterilization of the solution employed. This is easily accomplished by adopting a process discovered by Doctor Fernando López, Director of Mexico's Military Hospital of Instruction, based on the properties of acetate of sodium of changing at 60° centigrade and maintaining this temperature during the time it requires to pass into a solid state, which operation takes place very slowly. In this manner, a permanent temperature of 60° is obtained during several hours and in various sessions; as will be readily seen this is nothing more than a *tindalization* which does not require a constant watch or regulator, as the temperature remains at a permanent degree and never passes the required limit.

It has been observed that the better the cocaine is sterilized the less frequent are any accidents.

2. To allow the flow of a few drops of cephalo-rachidian fluid equivalent to the amount of the liquid to be injected (in general 0.01 cc.) for the purpose of avoiding an increase of intra-rachidian pressure, as it is believed that changes of pressure in the cephalo-rachidian fluid are the cause of accidents attending these operations.

3. To compel the patient to stay in a sitting position during the 10 or 15 minutes required by the anæsthesia, for the purpose of causing the cocaine to remain in the lower part of the canal.

This precaution in case the theory of the changes of pressure be true, would have no reason to exist.

Besides the immediate accidents above mentioned which in some cases have prevailed for 24 to 48 hours, a rise of temperature and cephalalgia have been observed as subsequent accidents, but neither these nor the former have endangered at all the life of the patients, and much less have they been followed by a fatal outcome.

From the appended statistics we infer that the regions of the body where surgical operations can be performed with this anæsthetic are from the ninth rib (4 resections; the abdomen<sup>1</sup>, laparotomy; the back, 1 anthrax; the genito-urinary organs, which are frequently diseased among soldiers;) down to the inferior members so often injured during a campaign. Operations of the importance of laparotomy, radical cure of inguinal and crural hernia, amputations and resections have been effected by its means.

The anæsthesia generally lasts from 1 to 1½ hours, which is more or less the time required for any of the operations performed in campaign service.

As we see, the advantages offered by Tuffier's injection over the general anæsthetics are :

1st. Easy application, as the operative manual required does not present many difficulties.

2nd. The possibility of its being performed by the surgeon himself, which does away with the services of an assistant..

3rd. Speedy action—10 minutes as a general rule.

4th. Absolute safety, as not a single case of fatal results has been recorded, and

5th. A small arsenal, easily sterilized and carried.

All these reasons should give rachidian anæsthesia, in the cases where it can be applied by military surgeons in campaign service, the preference over all other methods.

STATISTICS RELATING TO THE EMPLOYMENT OF TUFFIER'S INJECTIONS AT THE MILITARY HOSPITAL  
OF INSTRUCTION AT THE CITY OF MEXICO  
AND OF RESULTS OBTAINED.

NO. OF OPERATIONS	OPERATIONS.	AMOUNT OF AN- AESTHETIC.	RESULTS.	IMMEDIATE ACCI- DENTS.
28	Circumcisions	Gms. 0.02	Complete	No.
1	"	"	Unsuccessful	No.
1	"	"	Complete	Nauseas
1	"	"	"	Acceleration of pulse,
7	"	0.15	"	dyspnoea and vertigo
1	"	"	"	No.
30	" with cauterizing of chan- cres.	0.02	"	Vomiting
				No.
8	" "	0.02	Unsuccessful	No.
1	" "	0.02	Complete	Vomiting
9	" "	0.15	"	No.
2	" "	"	"	Vomiting
1	" "	"	"	Nausea
1	" "	"	"	Nausea and vertigo
1	" "	"	"	Nausea and dysp- noea
1	" "	"	"	Convulsions of inferi- or members, cold perspiration and vomiting.
1	" "	"	"	No.
1	Circumcision with cauterizing of chan- cres.	1.01	Complete	No.
2	Circumcision and scraping of vegeta- tions.	0.02	"	No.
1	"	0.02	"	No.
2	Circumcision and opening of bubo.	0.02	"	No.
1	Circumcision and scraping bubo.	"	"	"
1	Urethroplasty.	0.02	"	No.
2	"	0.15	"	No.
6	Internal Urethrotomy.	0.02	"	No.
4	"	0.15	"	No.
1	Internal Urethrotomy and opening of abscess.	0.02	"	No.
1	Resection of the urethra.	0.02	"	No.
1	Severing of the fre- num preputii.	0.02	"	No.
5	Cauterizing of pha- gedenic chancres.	0.02	"	No.
1	Scraping and caute- rizing papilomas, prepuce and glans	0.02	"	No.
2	Extirpating fungus from a testicle.	0.02	"	No.
1	Right side castra- tion.	0.15	"	No.
1	Resection of right side vaginal tunic.	0.02	"	No.
1	Resection of left side vaginal tunic.	0.15	"	No.
1	Incision of a peri- urethral abscess.	0.02	"	No.
1	Incision, scraping cauterization of ab- scesses on the peri- neum.	0.02	"	No.
10	Operations radical- ly curing inguinal hernia.	0.02	"	No.



NO. OF OPERATIONS.	OPERATIONS.	AMOUNT OF ANÆSTHETIC.	RESULTS.	IMMEDIATE ACCIDENTS.
1	Operations radically curing inguinal hernia.	Gms. 0.02	Unsuccessful	No.
1	" "	"	Complete	Vomiting
2	" "	0.15	"	No.
1	" "	"	Unsuccessful	No.
1	" "	"	Complete	Vomiting
1	Operations radically curing crural hernia.	0.02	Complete	No.
3	Opening and cauterizing bubo.	"	"	No.
1	Opening of bubo.	0.05	"	No.
1	Scraping of fungous bubo.	"	"	Vomiting
1	Extirpation of purulent inguinal ganglion.	0.02	"	"
1	" "	0.15	"	No.
7	Extirpation of external hemorrhoids	0.02	"	No.
1	" "	0.02	"	Dyspnoea, nausea
1	" "	0.15	"	No.
1	Forcible dilatation of the anus.	0.02	"	Vomiting
1	Forcible dilatation of the anus and cauterization of the rectum.	0.15	"	No.
1	Forcible dilatation of the anus and extirpation of the mucous membrane of the rectum	0.15	"	Vomiting
2	Incision, scraping and cauterizing a fistula of the anus	0.02	"	No.
1	Removal of cancerous rectum.	0.02	"	No.
1	Resection of the rectum.	0.02	"	No.
1	Cauterizing ulcers in rectum.	0.02	"	No.
1	Removal of papillomas in the anus.	0.02	"	No.
1	Opening of hepatic abscess.	"	"	No.
1	" "	"	"	"
1	Opening of hepatic abscess and resection of 9th rib.	0.02	"	Dyspnoea
1	" "	"	"	"
1	" "	0.15	"	No.
1	Exploring hepatic puncture.	0.02	"	Vomiting
1	Enlarging incision in hepatic abscess	"	"	No.
1	Partial resection of 9th right rib.	0.15	Unsuccessful	No.
1	Incision of abscess in the iliac region.	"	Complete	No.
1	" "	"	"	Vomiting
1	" "	"	Unsuccessful	"
1	" "	0.15	Complete	No.
1	Laparotomy exploring and removing tumor from intestines.	0.02	"	No.
1	Scraping and cauterizing dorsal antrax.	0.15	"	No.
1	Incision of abscess in the ischio-rectal cavity.	0.15	"	No.

NO. OF OPERATIONS.	OPERATIONS.	AMOUNT OF AN-ESTHETIC.	RESULTS.	IMMEDIATE ACCIDENTS.
1	Cauterization of ischio rectal cavity on account of abscess.	Grams 0.15	Complete	No.
1	Incision of abscess in ischio-rectal cavity.	0.15	"	No.
1	Removal of sebaceous cyst from gluteal region.	0.15	"	No.
1	Removal of dermal cyst from gluteal region.	0.02	"	No.
1	Removal of fibro-lipoma in sacral region.	0.02	"	No.
1	Amputation of thigh.	0.02	"	No.
1	" "	0.01	"	No.
1	" "	0.02	Unsuccessful	No.
1	Scraping of shin-bone.	0.15	Complete	No.
1	Disinfecting an open fracture.	0.02	"	No.
1	A cross cut on an infected wound on right thigh.		"	No.
1	Severing of ligaments and cannalizing of an infected wound on thigh.	0.02	"	No.
1	Removal of 3 fibromas from trochanterian and sacral regions.	0.02	"	No.
2	Arthrotomy on the knee.	0.02	"	No.
3	" "	0.02	"	Vomiting.
1	" "	0.15	"	No.
1	" "	0.02	Unsuccessful	No.
1	Puncture in articulation of left knee.	0.02	Complete	No.
1	Canalizing arthritis on purulent left knee.	0.02	"	Rise of pulse, dyspnoea and vomiting.
1	Removal of aneurismal varix from popliteal space.	0.02	"	No.
1	Removal of cyst from popliteal space.	0.02	"	No.
1	Incision and disinfection of abscess from popliteal space.	0.02	"	No.
1	Internal ligaments and removal of varicose veins.	0.02	"	No.
1	Removal of varicose veins.	0.15	"	No.
1	Scraping and cauterizing ulcer in leg.	0.02	"	No.
1	Incisions, scraping and cauterizing of abscess in the leg.	0.02	"	No.
1	Incisions, scraping and cauterizing of phlegmon on right foot.	0.01	"	No.
1	Incisions of abscess on sole of foot.	0.02	"	No.
1	Incision and cauterizing of gangrenous phlegmon on foot.	0.02	"	No.

## EPIDEMIC CATARRH ON SHIPBOARD.

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A NAVAL SURGEON is frequently called upon to treat certain infectious fevers that appear as epidemics on board his ship. The following report comprises a year's clinical observations of such cases that seem to be worth recording. It is hoped that a little light may be thrown on the origin of some of these fevers and attention drawn to the frequency of their occurrence.

The Battleship "Illinois" was commissioned on September 16, 1901, at Newport News, Va., and the officers and crew, averaging about 700 in number, took up their quarters on board. The ship was new, and well equipped with every comfort and convenience that modern shipbuilding now provides. Heating, lighting, closet and bathing facilities were good. Examination of the ventilation showed that it was fair below decks, with all louvers open and the "blowers" running at full speed. The effect of opening and closing the inlets and exits for natural ventilation, such as ports and hatches, was found to influence to a marked degree the percentage of organic contamination of the air. The crew were unusually strong and healthy, well selected, with a moderate number of unseasoned men and apprentice boys. Their food, water-supply, and clothing left nothing to be desired. The climate of Newport News at this time was hot and humid with considerable rain. This vicinity has been mentioned by other naval officers as being conducive to catarrhal fevers.

In a few days pharyngitis, bronchitis, and tonsillitis cases appeared at sick call, increasing in numbers until during October it was apparent that an epidemic was present that followed the usual symptomatology of catarrhus and was so designated.

Leaving Newport News in October the ship went to Yorktown, Va., for drill. Here the men were daily sent ashore for tar-

get practice, and the ship got well dried out by the cool, dry air, during the fine weather, blowing through open ports and hatches. The epidemic subsided at once. When the "Illinois" returned to Old Point and Newport News, in November, more cases appeared.

Going south to New Orleans and during the stay in that port through December and part of January, there were only a few sporadic cases of catarrhal fever and some malarial fever on the sick list. General liberty was given constantly to the crew and excellent weather prevailed. The last of January the "Illinois" returned north to Newport News, touching at Havana for coal. In February she proceeded to New York and after lying off Tompkinsville for several weeks went to the Navy Yard, Brooklyn, where she remained until the last of April and then crossed the Atlantic to Europe. From the time the cold weather began to be felt, after rounding Hatteras, in January, until the ship was in warm weather on her way to the Azores, in May, an epidemic of catarrhal fever was present on board. Over 100 cases, severe and mild, were treated and in addition there were three cases of erysipelas, 4 cases of measles, 40 cases of mumps, and 2 cases of scarlet fever, one of which had diphtheria bacilli in the throat.

In June the "Illinois" left the Mediterranean on her way to England. When the first chilly and damp weather was met the epidemic began again. An unusual number of cases of bronchopneumonia, beginning as such, was a feature of this particular exacerbation, in the men belonging to the Engineer's Division who were exposed to greater fluctuations in temperature.

There were no further epidemics during the year after leaving England in July. Excellent health was enjoyed by the crew at Christiania, Norway, and while the ship was in dry-dock at Chatham, England, during August. Sporadic cases of "colds," with fever and myalgic pains, occurred from time to time, designated as catarrhus epidemicus in view of the disease having been so prevalent. Men who had been previously attacked were peculiarly subject to relapses and to an ephemeral fever with a day or two of slight elevation of temperature and malaise.

This comprises a brief summary of the cruise of the "Illinois" during the year considered and a history of the epidemics on board.

A description of the disease is best made by grouping the symptoms given in the Medical Journal and personal notes.

*Symptomatology.*—During the epidemics the majority of the cases were of a respiratory type, beginning suddenly with aching pains in the back, head, and limbs. Chilly sensations, vertigo, constipation, weakness, anorexia, and fever were complained of. Examination showed an injection of the conjunctival vessels; the skin hot and dry; the tongue pasty and coated; the pulse rapid and weak or full and bounding. A few cases had a more gradual onset for several days with malaise and "cold in the head". The severe cases were markedly cyanosed and mentally apathetic. A decided inflammatory condition of some part or all of the respiratory tract was to be seen especially in the cases occurring in cold weather. Even when the throat was not complained of it would be found to be congested and "beefy," particularly in the cases that appeared in the warmer climates. The most severe neuralgic pain was a frontal neuralgia over one or both orbits in cases of acute coryza, during the stage of engorgement, before the sero-purulent discharge was established. It was probably due to the compression of delicate nerve filaments. Tonsillitis was commonly present involving one or both tonsils; they would be either simply inflamed and swollen or present the usual appearance of a follicular tonsillitis. A patchy, pseudo-membrane was noticed in many cases on tonsils, velum, or pharynx. A decided ulceration of the membrane, ragged in character, also occurred and such cases complained of much soreness of the throat.

The congestion of the pharynx had a peculiar striated appearance, dry and glazed, while in other cases an albuminous secretion, like the white of an egg, would partially cover it. Patches of grayish-white or yellow-green necrotic tissue were seen. A boggy, oedematous condition of the mucous membrane was occasionally noticed. All the cases with tonsillitis or pseudo-membrane had a peculiar putrefactive odor to their breath which indicated their condition before their throat was examined.

Cases with coryza would have a swollen and inflamed nose and the skin of the upper lip, near the nostrils, would be reddened or excoriated by the acrid sero-purulent discharge. Extension along

the respiratory tract was the usual sequence and in a few days, or even hours, there would be pharyngitis, tonsillitis, or bronchitis.

There was a distinct bronchitic type, beginning with pain over the primary bronchi and larynx, with a hoarse voice and a dry, irritating cough that seemed to "tear" the vocal cords and accentuate the congestive headache. Such cases were severe and tended to areas of capillary bronchitis or broncho-pneumonia. Pleuritic friction "rubs" were heard and a severe pleurisy followed two cases.

Another type of the disease began with fever, headache, nausea, epigastric pain and myalgia. There were no signs of inflammation of the respiratory tract until careful physical examination of the chest would reveal an area of bronchial breathing and in a day or two a blood-streaked, muco-purulent sputum would be raised with a slight cough. The respirations were increased to 25 or 30 a minute and the pulse weak and rapid. These were the insidious cases of broncho-pneumonia.

A transitory erythema was observed in a few cases. Purpuric petechiae and urticaria were also seen.

Enlargement of the cervical glands could be made out in nearly every case of tonsillitis and pharyngitis. Two cases originating at Newport News had the usual symptoms of the respiratory type but did not convalesce, running an irregular pyaemic fever with constipation, coated tongue, anorexia and weakness. There were no tympanites or iliac tenderness and Widal reaction was negative. The inguinal glands on one side were enlarged but there was no evidence of venereal disease, which was denied. One of these cases promptly recovered when the glands were dissected out at the Hospital to which he was sent. The other man slowly recovered at the Hospital.

The majority of the temperature charts presented a similar fever curve. Beginning with an initial rise of from 102°-104° there was a fall by lysis, with an evening exacerbation, in from 3 to 5 or 7 days. Profuse acid sweats marked the beginning of the fall. If convalescence was not established, owing to complications, there would be an irregular pyaemic fever curve.

14 cases had symptoms pointing to a decided involvement of the gastro-intestinal tract. Their symptoms were:—anorexia, vomiting, diarrhoea, myalgic pains, fever and prostration. Most of these cases had some respiratory catarrh also.

There was no purely neuralgic type noted, but a few cases complained of persistent neuralgic pains for many weeks and were slow in recovering their strength.

Occurring during the epidemics were cases of ephemeral fever which were considered to be aborted attacks owing to individual resistance. Men long in the service had such a fever with malaise, chilliness, and congested throat. Those who had had previous attacks were similarly affected after fatigue or exposure.

Age apparently played no part in susceptibility except in regard to the fact that the strong adult quickly recovered without complication. The marines, whose quarters were on the berth deck, were heavy sufferers in proportion to their numbers; one case that was transferred to the hospital dying of pneumonia. The apprentice boys, particularly those with enlarged tonsils and a lymphatic diathesis, also had severe cases and persistent cough often remained for several weeks. The weakest individuals seem to be the ones with complications. These will now be considered.

*Complications.*—Pleurisy, with or without exudation, and broncho-pneumonia were most common. Pertitonsillar abscess, otitis media, and infective arthritis also occurred. There were 6 cases of infective arthritis, not unlike a gonorrhoeal septicaemia, running an irregular pyaemic fever and having arthralgic pains or involvement of the smaller joints. In one case it was believed that an actual pyarthrosis was present and he was transferred to a hospital. No operation was performed and after several months he returned to the ship, without fever and very much stronger, but there was decided stiffness and soreness of the tarsal joints remaining for many months. Another case had two attacks of the catarrhal fever and was convalescing when a finger joint was involved. For many weeks he suffered with first one joint and then another affected. In the right arm the finger joints were successively inflamed, then the wrist, then the elbow, and finally the shoulder joint. He soon became weak and anaemic and a systolic souffle

was heard over the apex, transmitted to the left axilla. An irregular fever with morning remissions and evening exacerbations occurred. The salicylates and alkalies had no perceptible action or indeed any treatment besides a supportive and symptomatic one. He had been one of the cases selected to make a culture from his blood and a growth on agar was obtained of what was apparently a staphylococcus. It was considered of sufficient importance to determine if the agglutination reaction could be obtained with the *Micrococcus Melitensis*. A culture was secured from Prof. Wright while the ship was at Southampton, England, and the usual salt emulsion, according to his method, prepared. There was no reaction. The boy improved sufficiently to be sent to a Naval Hospital in the United States. The 4 remaining cases all recovered.

Insomnia was complained of by two cases after convalescence from the fever, and one case had melancholia with suicidal tendency. He stated he had had a similar attack, however, before he entered the service.

One case was complicated with a facial erysipelas on the second day and was sent to the hospital.

The tendency to frequent relapses has been previously mentioned in discussing the symptoms of the disease.

With the limited means to be had in a tiny laboratory for diagnosis placed on this ship examinations were made of the swabs from the nose and throat; of the sputum; of the urine; and of the blood. The results were as follows.

*Urine.*—30 cases were examined the first and second day of the disease. The specific gravity was generally between 1028-1034; color high and even reddish; reaction acid; and the coloring matters and solids about normal. Urea and uric acid were increased. On qualitative examination, sugar was not found, and albumen only once in a case where there was evidence of renal congestion, with some blood in the sediment. This condition cleared up on the second day.

*Blood.*—The blood from the ear was examined unstained in 40 cases and stained with Eosin and Methylene Blue in 12 cases. A decided leucocytosis of the polymorphonuclear neutrophils and



transitional leucocytes was observed. In the fresh specimens erythrocytes were seen, in nearly every case, to contain one or more refractile bodies, yellowish-brown in color, and of irregular shapes and sizes, generally from  $\frac{1}{8}$  to  $\frac{1}{4}$  the size of the corpuscle containing them. These corpuscles appeared shrunk in size and many of them would be seen clustered about a leucocyte. The refractile bodies apparently had a slow amoeboid motion. Moving in the plasma were similar irregular shaped, refractile bodies of different sizes and with a decided motion of their own, whirling and darting among the corpuscles. While at Newport News, Va., where so many fevers are called malaria, these bodies were thought to be forms of the estivo-autumnal parasite, although no crescents were found, and every field contained many of them. At New Orleans the blood of malignant cases of malaria was examined and the difference seen at once. Such cases had free pigment and leucocytes containing pigment; the corpuscles were distorted pale, and decreased in number; the plasmodium was not easily found and crescents were seen. These same refractile bodies also were commonly seen in the cases of fever occurring in midwinter at New York among men who never had malaria and therefore could not be explained. Quinine had no specific action in controlling the fever. The most reasonable explanation has been recently seen in a medical journal where such refractile bodies were found by an army surgeon and considered to be blood plates possessed of amoeboid motion. It is interesting to note that Dr. Graham of Beyrout, in an article on epidemic Dengue, described similar bodies which he considered the cause of that disease. In this relation attention is called to the difference in diagnosis of catarrhal fevers in the tropics, where what is evidently the same disease has been considered to be Dengue, Thermic, Grippe, or Remittent fever according to the type of fever present in the epidemic. A recent description of these refractile bodies was made in connection with yellow fever. They are probably blood plates increased with the leucocytes.

Under aseptic precaution blood was taken from the median basilic vein, with a hypodermic syringe, and inoculations of agar bouillon made. In 3 cases out of 5 a growth was obtained and upon examination found to be composed of irregular size cocci.

similar to a degenerated culture of staphylococci, forming bunches, pairs, or chains. Transfers on gelatine, agar, and bouillon were made but no growth occurred.

Six cases were selected and their blood examined for the Iodophilia reaction. It was not found.

One of the two cases with inguinal adenitis showed a decided increase of eosinophiles in his blood after several weeks of fever.

*Swab Examinations.*—71 swabs from the nose and throat were examined to see the predominating variety of bacteria in the individual case. These swabs were rolled on glass slides, previously sterilized in the flame, and then fixed and stained by Loeffler's Methylene Blue Solution. A simple morphological description can only be given for with the means at hand for culture the 8 cases examined showed only staphylococcic and streptococcic growths. All the varieties of the bacteria which are usually found in the throat were enormously increased in numbers in the swab examination. Cocci and irregularly-shaped and sized rods abounded. Staphylococci, streptococci and especially diplococci were seen. The diplococci were of different sizes and occurred as single pairs or in groups, tetrads and chains. The predominating number of diplococci were somewhat smaller than the pneumococci and without a capsule. Pfeiffer's bacilli were looked for and not recognized. There were comparatively few very tiny diplococci present. In the nasal secretions, from cases with acute coryza, diplococci were practically the only bacteria seen and were of the same size as those predominating in the swabs from the throat. They were either free or in the pus cells.

In the sputum from the cases with broncho-pneumonia and bronchitis, among the myriads of cocci and bacilli, would be found bunches of diplococci of similar appearance. In nearly every field they would be the first elements to attract the eye.

In the swabs from cases which did not complain of their throat, yet had an angry looking pharynx, nearly all the bacteria were diplococci.

Where the tonsils were involved, and especially in the cases occurring during the epidemic at New York with ulcerations and pseudo-membranes, there were a large number of "rods" among

the bacteria on the swabs. There was a sausage-shaped rod designated as a putrefactive bacillus. A slender, fusiform, slightly curved rod, of varying lengths and widths, with or without several chromatine granules, was called a leptothrix, and distinguished by its pointed end from a similar rod with many chromatine granules, rounded ends, and fainter staining body, called a streptothrix. There were long, faintly-staining rods, having square or rounded ends, with or without beading, occurring in jointed segments or lying side by side in bundles, called mycelial threads. Branching was often noticed among these rods in the swabs but in none of the cultures did any growth appear, probably owing to the fact that ordinary media is not a suitable soil. From their morphology they belong to a group of higher bacteria.

The swab from one of the cases of scarlet fever gave characteristic diphtheria bacilli and a culture was obtained on serum media. It was the only case in which that organism was seen.

The other elements found in the swab from the throat were necrotic tissue, pus, and epithelial cells, these latter showing invasion by bacteria. The sero-purulent discharge from the nose consisted principally of pus cells and mucous. The blood-streaked pneumonic sputum contained fresh blood cells, pus cells, mucous, and epithelial cells. Cases of persistent bronchitis had a similar sputum, but without blood, and both of these varieties were loaded with bacteria.

*Summary.*—There was undoubtedly a contagious factor producing these catarrhal fevers during the epidemics on the "Illinois." The majority of the cases had a respiratory catarrh indicating that the air passages were not the most common seat of the infection. The results of the examination of the urine were negative. The blood examinations indicate a protective leucocytosis, and the successful cultures point to a direct invasion of the blood by cocci. The 6 cases with pyaemic fever and arthralgia would be explained by such an infection. The refractile bodies found in the blood were probably blood plates, perhaps temporarily increased for additional protection. The symptoms of the individual cases varied according to the degree of resistance and portion of the respiratory tract involved but there were similar

symptoms and temperature curves common to all. The examination of the swabs from the nose and throat and of the sputum showed a multiplication of the bacteria usually found in the throat and the predomination of a medium sized diplococcus which occurred in groups, tetrads or in chains. Finding it alone in certain cases of coryza and pharyngitis and so abundantly in all cases warrants the suggestion that this diplococcus can cause an acute inflammation of the respiratory tract. Pfeiffers Influenza Bacillus was not recognized as it would have been if present in any numbers. Is it the only organism that can cause catarrhal fever or can other bacteria have a similar action in producing inflammation of the respiratory tract, perhaps not so virulent a toxine being formed? Probably there was a mixed infection, in these cases, by the bacteria usually found in the throat and it is not difficult to believe that through the rich mesh of lymphatics the toxins from the multiplying bacteria on the mucous membrane, are quickly absorbed and even a direct invasion of the body by cocci take place. Man of all animals is most susceptible to pyogenic infection and with such a septic throat and lowered resistance there seems to be no reason why this should not occur. The enlarged cervical glands indicate a protective filtration with inflammation of these safeguards to the body. The ulceration and necrotic patches found in the throat were apparently owing to the multiplication of the leptothrix, streptothrix, and higher bacteria, under favorable conditions, and their toxins undoubtedly played a part in producing the disease.

*Conclusions.*—In describing the history of the epidemics on the "Illinois" mention has been made of the factors in ventilation that tended to favor the development and spread of the disease. The proximity of the berth deck to the engine and firerooms always keeps it at a high temperature and owing to the lack of sunlight and fresh air it is usually damp and close, especially in the tropics. It furnishes ideal conditions for disease germs to propagate, and to overcome these should be the first duty of sanitation. When the necessary means for ventilation are shut off during wet weather, cold, or in a storm at sea, the artificial means should be sufficient to keep the air pure and free from

organic smell. Between 200 and 400 cubic feet was computed to be the allowance per man on deck and this would mean a change 3 or 4 times an hour. In cold weather there was no means of heating the air brought through the intakes to this warm deck and consequently it was customary to run the blowers at a quarter to a sixth of the full speed which had been found necessary to give only fair ventilation. Even if these blowers had been run at full speed the men themselves would have closed the shutters in the air ducts to stop the disagreeable draughts. Some means should be made to warm this air before it is delivered, by steam coils or electric resistance coils, and in this way allow the full volume of necessary air to be delivered.

The louvers in the crew's quarters were not provided with movable hoods to deflect the current of air from a man's hammock and therefore he would surreptitiously close it and deprive a compartment containing 40 or 50 men of perhaps  $\frac{1}{6}$  of its air supply.

In the tropics it is not feasible on a war ship to cool the air delivered below but a means for refrigeration is found in the small fans placed in the officers' quarters. The same means can be had for the crew when electric blowers are used and the additional heat of steam blowers is thus removed. The "Kearsarge" and "Kentucky" are provided with such fans. If means for heating the air are provided their ventilation should be ideal. During rainy, cold, or rough weather when the ports and hatches are closed the blowers should be speeded to compensate for the difference in ventilation.

Not only on this ship, the "Illinois," was this influence of ventilation on the catarrhal fevers observed but on other ships in the service it has been noted. During the rainy season at Manila the epidemic began on shipboard when the weather was humid and hot and the men were driven below decks by the rain. The "Olympia" had many such cases on board at different times which were then classed as Remittent fever. No microscopic examinations of the blood were made. It was a similar fever with a tendency to gastro-enteric catarrh, although the respiratory tract was also affected. In colder climates the respiratory tract has a greater

reaction. The same fever on other ships in the fleet was called by different Medical Officers, according to their point of view. Dengue, Catarrhus Epidemicus or Thermic Fever. The "Olympia" had been free from epidemic during the dry season until in June on her way home. Shortly after leaving Hong Kong, cold, rainy, and heavy weather caused the ship to be closed. 114 cases were treated in the next few weeks. This epidemic subsided after good weather was encountered. On the "Raleigh," in '97 and '98, the closing of the ship was held responsible for many such outbreaks. At the Boston Navy Yard, '99, '00, '01, the marines in garrison had several epidemics of catarrhal fever appear. Here again was a condition of overcrowding in proportion to the means of ventilation.

Turning to the recorded experience of other physicians in various parts of the world, the influence of overcrowding, with its concomitant evils, has been seen again and again, in epidemics arising in schools, camps, asylums, public institutions of all kinds, garrisons at home and abroad, and upon troop ships. It is suggestive to notice the association of exanthematous diseases to such outbreaks of catarrhal fevers reported. On the "Illinois," measles, scarlet fever with diphtheria, and mumps appeared. At the Boston Navy Yard measles, scarlet fever and diphtheria were seen.

*Treatment.* Prophylaxis by means of improving the sanitary conditions should receive the first attention. Not only the ventilation, but cleanliness, general and individual, should be seen to. Fresh air and sunlight will do much and when not obtained then artificial lighting and a sufficient quantity of air at a moderate temperature should be supplied.

The individual resistance and condition of the tissues as a culture soil undoubtedly play an important part. The quantity and kind of food supply, especially in the tropics, in proportion to the work required, determines the degree of accumulation of tissue waste. An overloaded system with a decrease in the natural alkalinity of the blood would probably furnish a more suitable soil for a virulent bacterium to develop upon. In this regard it is suggestive to note the susceptibility to catarrhal

fevers, tonsillitis, and coryza, of those whom we say have a rheumatic or gouty diathesis. The other extreme, lack of proper nutrition and debility, is also important.

The effect of hot, humid, foul air is to relax this membrane and to dry the natural secretions, thus favoring infection. "Street car colds" illustrate this action. The organisms normally found in the throat were found in these epidemics in great numbers. Under favorable conditions what seemed to be ordinary "colds," bronchitis, and tonsillitis apparently developed until there were epidemics of catarrhal fever. The variability in virulence of different strains of pneumococci in laboratory experiments was recently described by Dr. J. W. Wasburn in the Croonian Lectures printed in the *London Lancet*. This variation can be produced artificially in a few generations of cultures in the laboratory. It is not difficult to understand why inert organisms in the throat, under certain conditions, may develop an unusual pathogenesis. This development in virulency has been noticed in many such epidemics and commented upon. By coughing and sneezing the virulent germs are disseminated in sufficient quantities from an infected case to inoculate a new case. The contagiousness of "colds" has long been noticed. Do we not often make a diagnosis of "Grippe" when the Pfeiffer's bacillus is not present and the catarrhal fever is caused by other organisms normally found in the throat? How often do we examine a swab from such cases?

On shipboard, below decks, the germ-laden moist air with organic matter from the lungs will find many excellent resting places to dry and be redisseminated. The cork paint work which is used to prevent "sweating" of the steel surface is a good example. Where mess tables are slung below decks the greasy crumbs of bread and meat are generally brushed off and trodden into an organic paste that quickly decomposes in the hot moist atmosphere. The decks are no longer flooded with water for the purpose of cleanliness and shellac is used to cover the linoleum placed on the steel decks. Sweeping and swabbing should be done daily and the shellac applied at least once a week in living spaces much frequented. The alcohol used to cut the

shellac is in itself an excellent antiseptic. The influence of sunlight and fresh air that is obtained on the upper decks does not make them so important. In tropical climates the crew should berth on the upper decks whenever it is practicable. Long exposure to the sun and wet clothes should be avoided as conditions lowering the individual resistance. When cases of catarrhal fever arise the advisability of isolation of the cases should be considered.

The method of treatment which has been found to be the most satisfactory is to give a hot mustard foot bath and put the patient to bed, warmly covered. Calomel and soda in small doses, followed by a saline, is used to freely open the bowels. A powder or capsule of quinine, salol and phenacetine in from 3 to 5 grain doses relieves the most distressing symptoms. Locally a Seiler's Solution or Dobell's spray can be given for the coryza, and Dobell's, or Potass. chlorate and Myrrh Gargles for the inflamed throat. In cases with tonsillitis a solution of carbolic, glycerine, and alcohol, gently swabbed on the necrotic surface removes this material and gives relief. A large hot poultice, externally, acts well in some cases and when an abscess forms it should be incised at once. A liquid diet every three hours, in small quantities, and stimulation when necessary, is part of the treatment. During convalescence an iron and strychnine tonic was given to overcome the lack of appetite and energy. The treatment of the complications depends upon the case. Creasote and Carbonate of Creasote acted remarkably well where there was a broncho-pneumonia. The various sedative and stimulating cough mixtures were given freely as required.

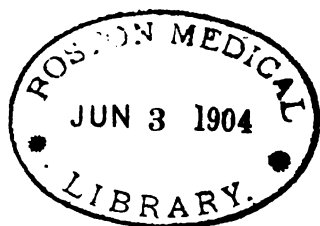
Many different drugs were tried with equal success and it is believed they all do little more than relieve distressing symptoms. Antipyrine, Acetanlid, Aconite, Sodium Salicylate, Amoniated Tincture of Guaiac and Bichloride of Mercury were among these. Tannic Acid and Glycerine Gargle with Tinct. Ferric Chloride or Iodine painted on the tonsils was another form of treatment in tonsillitis. Inhalations of Terebene, Turpentine, Creasote, or Tinct. Benzoin Comp. were used for the cases with spasmodic cough. Cod liver oil and Creasote was given internally and the stimulating cough mixtures tried.



The cases with pyaemic fever and joint symptoms were not influenced by the Salicylates or Alkalies to any appreciable extent. It was thought an effect was produced and then a relapse occurred. The Tincture of Iron in large doses acted well in combination with careful diet. Locally, during the acute pain and swelling, Fuller's Lotion, Lead and Opium, Oil of Wintergreen or an ice bag would be applied. The joint was immobilized and supported. Later when the inflammation partially subsided an ointment of Ichthyol and Mercury, Tr. Iodine, hot bathing and massage were used.

#### CURIOSITIES OF CUBAN PRACTICE.

CUBA is unfortunate in not having that amount of education, common in the United States which makes citizens appreciate and obey sanitary laws. Their ignorance makes them joke about disease and their religious intolerance and fanaticism makes them fatalists. One often hears as an excuse: "if it is to be, it will be," no matter what one does. "Prophylaxis" is a medical myth with them and no one knows it better than I do after having been an insurgent for two years. I remember often giving quinine for malarial fevers and the people putting it behind their favorite saint and then going out and circling a tree backwards three times while they repeated some mystic prayer, though the patient never got the medicine. There was a "Practicante" in the Insurgent Army who never failed to have chicken when he wanted it. He devised the very effective scheme of going among the ignorant sick and saying he could tell them in five minutes whether the disease would end fatally or not. For this he required a chicken (a fat one of course) which he cleaved to the half through the breast and then laid it on the patient's stomach. In five minutes he would remove the cleft bird and if it did not smell putrid the patient would recover and he ate the chicken. How is that for "medicine as I have seen it practiced"?—CAPT. E. C. POEY, U.S.V.



## Reprints and Translations.

THE SANITARY CORPS OF THE FRENCH ARMY.  
FROM THE GERMAN OF DR. PAUL MYRDACZ,\* PHYSICIAN IN THE  
AUSTRO-HUNGARIAN ARMY.

By FRANCIS W. F. WIEBER M. D.  
SURGEON IN THE UNITED STATES NAVY.

### HISTORY.

THE Sanitary Corps of the French Army, as an integral and organized part of it, came into existence by a decree of Louis XIV in 1708. This established 272 permanent positions for Sanitary Officers ; among these were 104 chief physicians and surgeons in 51 border towns. The first regulations for the corps appeared in 1718.

The earliest references to military surgeons in French history date from the time of Charles the Bold, 1467-77, who employed 22 surgeons in his army of 20,000 men. Prior to him knights and princes employed their pages for assistance in case of sickness or injury. None were provided for the troops.

In 1597 during the siege of Amiens under Henry IV, ambulances and field hospitals were in use, again, 30 years later, during the siege of La Rochelle, no provisions existed for the care of the sick and wounded, "they were left, where they fell." In 1629 regimental surgeons are mentioned. In 1630, field hospitals and ambulances were again in use.

The war over, the surgeons were discharged and all measures, which according to the humane instincts of the Commander-in-Chief had been taken, for the care of the sick and wounded, ceased.

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\*Das französische Militär-Sanitätswesen. Geschichte und gegenwärtige Gestaltung. Bearbeitet von Dr. Paul Myrdacz, k. und k. Regimentsarzt 1. Classe etc. 8vo, pp. 81. Wien, Verlag von Josef Safár, 1895.

In its early days, the control of the Sanitary Corps rested in the hands of the Chief Physician and Surgeon of the King. Later it was placed in the hands of a sanitary commission or council which was composed of medical officers, line officers and administrative officers.

Sanitary officers were of three kinds: physicians, surgeons and pharmacists. The former took official precedence over the surgeons on all occasions. In hospitals the chief surgeon could not undertake a capital operation except with the approval and in the presence of the chief physician, etc. Constant quarrels resulted from this condition and the subordination of both in hospitals to administrative officers since 1749 was in a large measure, due to this fact. After this the entire internal discipline in hospitals was placed in their hands. The official distinction between physicians and surgeons was abolished in 1852.

Sanitary officers of hospitals and of the troops were not interchangeable except under special and urgent conditions. In time of war, the sanitary officers of the hospitals formed an ambulance corps, which followed the army and established the necessary field hospitals. Ambulances for the sick and wounded were provided in the proportion of one, with a capacity for six patients, to every 1000 men of the force.

The original decree of Louis XIV provided for only one surgeon to a regiment. Under Louis XV an assistant surgeon was added, and moreover, two surgeon's apprentices to each battalion. The personnel of the Sanitary Corps recruited itself very largely from a body of "élèves," who were instructed in the military hospitals of Strassburg, Metz, Lille, Brest and Toulon. The course of instruction lasted about three years and was followed by an examination, which established the qualifications of the students for higher positions. During the revolution, Strassburg, Paris and Montpellier became the principal centres of instruction. There alone 550 pupils found admission. All these institutions, however, proved inadequate to fill the vacancies caused during the continuous wars of the republic and the first empire. Gradually all instructors and pupils were ordered to the front, so that in 1802 all the schools were closed. Civil physicians

and students of medicine were called on to fill positions in the Sanitary Corps.

During these wars the "flying ambulances" or movable hospitals were developed by Larrey. Military nurses were systematically trained in the rendering of first aid, including the transportation of the wounded, by the efforts of Percy. The good results attained led to the organization of six battalions of nurses.

The schools of instruction remained closed until 1816. The status of the sanitary officers, however, was too unsatisfactory to attract enough young men to them to enable them to fill all sanitary positions from their pupils. Civil physicians had to be depended on again to help fill the vacancies. With an insufficient number of medical officers and nurses and inadequate supplies, the Crimean and Franco-Prussian wars were undertaken, which laid bare the defects of the system and led to a reorganization of the Sanitary Corps in the new Army Administration law of July 1st, 1889. This gave the Sanitary Corps complete autonomy over its personnel and material.

#### PERSONNEL AND MATERIAL.

In the present organization of the Sanitary Service of the French Army, 1,300 Medical officers and 185 Pharmacists form the commissioned force of the sanitary corps. They hold the following grades :

1	Inspector General	rank	General of Division
9	General Staff Surgeons }		
1	" " Pharmacist }	"	Brigadier General
45	Chief Staff Surgeons, 1st class, }	"	Colonel
6	" " Pharmacists, " " }		
45	Chief Staff Surgeons, 2nd class, }	"	Lieutenant Colonel
6	" " Pharmacists, " " }		
320	Staff Surgeons }	"	Major
46	" Pharmacists }		
480	Regimental Surgeons }	"	Captain
68	" " Pharmacists }		
300	Surgeons }	"	Lieutenant
43	Pharmacists }		
100	Assistant Surgeons }	"	Sub-Lieutenant
15	" " Pharmacists }		

The Corps is recruited from pupils of the military sanitary schools at Lyons and at Val de Grace. In case of war, necessary additions are made from the Territorial Army and from the reserve.

Administrative officers of hospitals form a distinct corps of officers who are trained in a special institution.

The central direction of the entire service rests in a Bureau under the minister of war.

The nurse corps consists of twenty-five detachments, which are distributed among the military hospitals under the immediate command of administrative officers, who are under the orders of the sanitary officers. It numbered 5921 men in 1882.

General Staff Surgeons are available as Chief Surgeons of Departments and of Army Corps. As such they are placed in charge of all military sanitary matters pertaining to them.

The enlisted personnel of the service consists of :

1. The nurses of the troops (*infirmiers régimentaires*). These are divided into two grades and are selected from suitable privates at the end of their first year of service. After a year's instruction in their new sphere, they are promoted to the higher grade. There is one nurse to every company, squadron or battery in war time. They do duty in the sick rooms of the barracks and, on the march, and at target practice, they carry the emergency outfits.

2. The regimental litter bearers, four to a company, squadron or battery in war.

3. The nurses of the hospitals and field ambulances. They are recruited as such and serve with the troops while awaiting vacancies in the nurses' detachments. Their training is both professional and clerical.

4. The litter bearers of ambulances. These are made up from supernumerary bandsmen, theological, medical and pharmaceutical students serving in the Army, reserve nurses, etc.

The sanitary service in time of peace comprises that in

1. Regimental sick rooms. These have a capacity of  $2\frac{1}{2}$  to 3 % of the force.

2. Hospitals, which comprise military hospitals proper, civil hospitals with wards for military persons, sanatoria, convalescent depots, etc. Sanitary supplies are stored in depots at Paris Algiers and Marseilles.

Sanitary service in the field comprises that with the troops, the ambulance corps, the field hospitals, evacuation hospitals, sick rooms and diet kitchens at railroad stations, the hospital trains, the convalescent and depot hospitals.

The sanitary equipment is as follows :

1. Every infantry battalion, cavalry brigade and group of horse artillery has a sanitary supply wagon. Among other supplies, this carries ten water-tight pouches for dressings, and the outfit for the dressing stations arranged in six baskets. One of these pouches accompanies every squad of four litter bearers.

2. The equipment of a regimental nurse, which is carried in a knapsack and in two cartridge boxes.

3. The ambulance knapsack, which contains, besides dressings and drugs, an outfit for the treatment of asphyxia. One is provided for every company of infantry.

4. A pair of pouches for a squadron of cavalry which corresponds to the ambulance knapsack for the infantry.

The sanitary personnel of the ambulance corps of an infantry division consists of 7 medical officers, 30 nurses and 98 litter bearers. With the other personnel it numbers 229 men, 101 horses and pack animals, 21 wagons, among which are 8 ambulances. The ambulance corps of headquarters has 14 ambulances.

The outfit contains 6980 dressings, 132 litters, 2 ambulance tents system Follet one tortoise tent and some other things. The latter can hold 30 wounded.

A field hospital carries an outfit based on the care of 100 sick or wounded for 3 months, which is carried on 4 wagons. There are 8 to an army corps. An evacuation hospital carries 2 outfits for field hospitals, 3 outfits for improvised hospital trains, 2 reserves of drugs, 4 reserves of dressings, 1 reserve equipment for the troops, 1 steam disinfecter. Both have Follet's hospital tents, having a capacity of 28 beds. They can be heated in winter. Of movable barracks 3 systems are in use, Dörfer's and Espitalier's.

Temporary hospitals have an equipment which is based on the care of 50, 100, or 250 patients for the period of 3 months.

DIRECTION AND EXECUTION.

The direction of the sanitary service, under the authority of the commanding officers, rests with the chief medical officer.

The chief surgeon of the division directs the service of the ambulance corps and of the field hospitals after getting his orders from the commanding general.

The dressing stations are established by the surgeons of the troops near the regimental reserves. As a rule all surgeons and troop nurses are stationed here. Litter bearers under the direction of the junior surgeons give first aid on the battlefield whenever conditions permit. At the dressing station, every case is examined, dressed, tagged, and removed to the ambulance station by the ambulance litter bearers. This station is established near the reserves of the division in available buildings or in tents. Here the wounded are assorted and sent to the rear, if possible, and necessary operations are performed. The field hospitals are established near the ambulance stations which they relieve or supplement. The personnel of those in reserve may be ordered to assist at the ambulance stations.

The duties of sanitary service in the rear zone consist of (1) sending to the rear all patients that can be transported, (2) caring for the sick and wounded whose condition does not permit of transportation, (3) caring for trivial cases that can be returned to duty in a very short while, (4) furnishing sanitary supplies where needed. It includes the stationary and evacuation hospitals. From the latter, patients are sent to the rear, either by permanent hospital trains, or ordinary trains, according to their condition.

Permanent hospital trains consist of 23 cars, of which 16 are occupied by the sick and wounded. A car holds 8 beds. The sanitary personnel consists of 2 medical officers, 1 pharmacist and 24 nurses.

Improvised hospital trains are made up from freight cars. The personnel of such a train of 40 cars holding 400 patients are 1 staff surgeon, 1 pharmacist and 45 nurses.

Ambulances are of two types: heavy four wheeled and light

two wheeled wagons. The former hold 10 patients sitting up or 4 lying down. The light wagons hold 2 patients lying.

Sanitary supplies can be replenished at the front from the

1. Ambulance Corps of headquarters.
2. Depot hospitals.
3. Supply stations.

Three officially recognized aid societies are legally empowered to cooperate with and under the Sanitary Corps in time of war on land or at sea. Their work consists principally, in establishing hospitals in places where the army sanitary accommodations are insufficient in fortresses or other places in the rear zone, and in sending patriotic gifts to places designated by the cabinet war minister. They also take charge of the service at railroad stations. They are not allowed at the front.

A delegate from each society and a sanitary officer form a commission, which considers all questions arising as to their sphere of usefulness.

Another commission composed of the presidents of the societies or their representatives, the delegates above mentioned, the sanitary chief officer of the supply depot in Paris, a naval surgeon and an administrative officer meet semi-annually or oftener, under the presidency of the Chief of the Sanitary Bureau, to consider questions submitted by the minister of war or the societies.

The personnel of the aid societies in the rear zone is subject to military law.

The societies are allowed 1 fr. per day for every man subsisted in their hospitals and 0.25 fr. for every meal furnished from their special diet kitchens at railroad stations. Foreign aid societies can be admitted as auxiliaries by authority of the minister of war.



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**WILLIAM SHIPPEN, JUN.**  
**DIRECTOR GENERAL OF THE MILITARY HOSPITALS OF THE**  
**CONTINENTAL ARMY—1777-1781.**

*From the Portrait by Gilbert Stuart in the possession of the Shippen Family.*

## Editorial Department.

### The Surgeon Generals of the United States Army

#### III. WILLIAM SHIPPEN, JUN., DIRECTOR GENERAL OF THE MILITARY HOSPITALS OF THE CONTINENTAL ARMY, 1777-1781.

**F**OR three months after the removal of Dr. Morgan, the medical department of the army was without a head. During this interval Drs. William Shippen, jun., and John Cochran prepared a scheme for the reorganization of the medical department, based on that of the British service, which, bearing the approval of General Washington, was adopted by Congress with some small modifications upon the 7th of April, 1777 and four days later Dr. Shippen was elected Director. Dr. Philip Turner of Connecticut, a surgeon of great skill and vast experience was at first elected to this position, but at the same session, this vote was reconsidered and Dr. Shippen elected in his place.

William Shippen, jun., was born in Philadelphia on the 21st of October, 1736. He was the son of Dr. William Shippen, one of the founders of the Pennsylvania Hospital and the University of Pennsylvania, and for thirty years a trustee of Princeton College. Chief Justice Edward Shippen was his nephew. Dr. Shippen was graduated at Princeton in 1754, and at once began the study of medicine with his father. In 1757 he went abroad and continued his studies in London, Edinburgh and Paris, receiving his doctorate at the great Scottish University in 1761. When in Europe he was strongly impressed with the need for systematic medical instruction in America, and upon his return in 1767 promptly materialized his views by the establishment of a course in Anatomy the first lecture of which he gave in the Statehouse in Philadelphia in the presence of a distinguished audience, and the remainder in his father's house before a class of twelve mem-

bers. In his introductory lecture he suggested the institution of a medical school in the city, and when three years later, the medical school of the College of Philadelphia—now the University of Pennsylvania—was established, he was chosen the first Professor of Anatomy and Surgery, and also taught midwifery a branch of medical practice to which he desired especially to devote himself. From boyhood he had been remarkable for his oratorical ability and his lectures soon became famous, being given annually for many successive years, with the omission of 1776 and 1777 when he was prevented from teaching by the stress of military service.

On July 15, 1776, Dr. Shippen was appointed chief physician of the flying camp of ten thousand men established by Congress at Trenton; on October 9th Congress directed him to establish a general hospital in some place, not in the immediate vicinity of this camp, for the troops stationed in New Jersey; and on the 24th of November his supervision was extended to include the entire hospital service west of the Hudson river, Director General Morgan's control being limited to the territory east of that stream. In this circumstance originated the differences between Shippen and Morgan which afterward led to a serious estrangement and to much embarrassment of the work of both.

In the scheme for the reorganization of the medical department adopted by Congress in April, 1777, being substantially the plan drawn up by Shippen and Cochran, future clashing of authority was avoided by making the Director General the chief of all the medical services of the Continental forces, and specifying the rank in the service of the various grades. Deputy Directors General were provided for three of the four military districts, the fourth being under the personal supervision of the Director General himself. Assistant Directors General were provided for the command of hospitals, and Senior Surgeons, Second Surgeons and Surgeon's Mates provided for their medical service, while other work of the hospitals was performed by apothecaries, commissaries, matrons, storekeepers, stewards and nurses. The practice of physic and surgery in each district was superintended by a physician general and a surgeon general, while a physician and surgeon general was attached to each separate army. This large number of high offices was provided in order to make the service attractive to the best men in the medical profession and

appears to have been entirely successful. The Director General however being still embarrassed by local duties, in the following February another deputy director was created and the Director General relieved from local duty and from supply service.

The service of the sick was much expedited by this legislation but renewed complaints arose, which materialized in definite charges by former Director General Morgan, who had himself recently been exonerated by Congress, and by Surgeon General Benjamin Rush, who was a warm partisan of Morgan. Dr. Shippen was after some months of waiting brought to trial and was amply and honorably acquitted.

On September 30th, 1780, the medical service was again re-organized and simplified, providing for a Director General, chief hospital physicians, who should also be surgeons, chief physicians for each separate army, hospital physicians, surgeon's mates, a purveyor, an assistant purveyor, an apothecary and an assistant apothecary, stewards, matrons, orderlies and nurses.

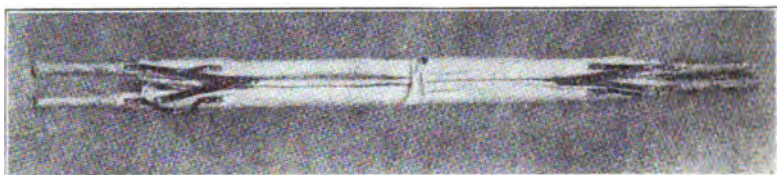
Dr. Shippen was re-elected Director General under the provisions of this act but served only three months, resigning on the 3d of January, 1781, and taking up professional work in Philadelphia. He at once resumed his former vogue both as a teacher and practitioner. "Nature," says Thacher, "had been uncommonly bountiful in the form and endowments of Dr. Shippen. His person was graceful, his manners polished, his conversation various, and the tones of his voice singularly sweet and conciliatory. In his intercourse with society he was gay without levity, and dignified without haughtiness and austerity. He belonged to a family which was proverbial for good temper. His father whom he strongly resembled in this respect, during the long life of ninety years, had scarcely ever been seen out of humor. He was also particularly agreeable to young people."

Some ten or twelve years later he suffered a great grief in the loss of his son, to whom he was profoundly devoted. From this time he began gradually to withdraw from active life and devoted himself largely to religious pursuits until his death which occurred in Germantown, July 11, 1808. His portrait by Gilbert Stuart, with which this sketch is illustrated is still in possession of the Shippen family to whose courtesy we are indebted for permission to reproduce it.

JAMES EVELYN PILCHER.

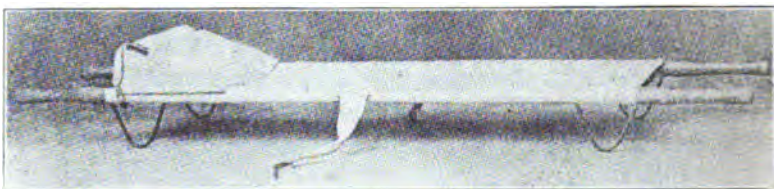
## THE NEW SERVIAN ARMY LITTER.

**C**OLONEL Borisavlievitch-Petzutch of the Servian Army Medical Department has devised a new litter which has recently been adopted in their service. It is composed of two wooden side bars, 2 m., 45 cm. long. Upon the side bars is stretched a canvas 1 m. and 75 cm. long. A pillow is placed upon



**The Servian Army Litter. Folded.**

the canvas forming with it an angle of 25 degrees, and resting upon a round traverse. Below the pillow there is an open space in which may be deposited objects necessary for the injured or even dressing materials. The litter rests upon legs of round iron, 14 centimeters high. It folds by iron traverses quite similar to



**The Servian Army Litter. Open.**

those of the old Halstead litter of the United States Army. In the middle of the litter on each side is a broad band of webbing which may be used both for retaining the patient in place and for binding the litter when folded. It weighs eight and a half kilos and costs eleven francs.



## Reviews of Books.

### DOUGLAS' SURGICAL DISEASES OF THE ABDOMEN.\*

**T**HE editor has pleasure in again inviting attention to the valuable work on "Surgical Diseases of the Abdomen" by Dr. Richard Douglas of Nashville, which was reviewed in the last number of the JOURNAL with very hearty approval. By a slip of the types however, the publication of the book was attributed to the wrong publisher and especial attention is directed to the fact that it is issued from the press of P. Blakiston's Son & Co. through whose instrumentality so many valuable publications are brought before the medical profession.

### A TEXT BOOK OF OPERATIVE SURGERY.†

**T**HIS volume covers the surgical anatomy and the operative technic involved in the operations of general surgery. The special field of each region is carefully considered from an anatomical point of view and the general surgical considerations necessarily involved in the various operations are carefully pointed out.

The systematic arrangements of the subjects are on a line entirely original; each operation is considered under various headings giving the description, preparation, position, landmarks, line of incision, and the details of the operation, in such a concise manner as to leave nothing to be desired.

It is manifestly impossible to include all the various operations for the same conditions and the author has selected what to

\***Surgical Diseases of the Abdomen**, with Special Reference to Diagnosis. By RICHARD DOUGLAS, M.D. 8 vo. pp. 883, with 20 full page plates. Philadelphia, P. Blakiston's Son & Co., 1903.

†**Text-Book of Operative Surgery**. Covering the Surgical Anatomy and Operative Technic involved in the operations of General Surgery. Written for Students and practitioners. By WARREN STONE BICKHAM, PHAR. M., M. D. 8vo; 984 pages, with 559 illustrations, entirely original, Philadelphia, New York, London, W. B. Saunders & Co., 1903.

him seems the most desirable, although he might have included Brinkman's method of draining the pleural cavity in empyema and Connel's intestinal suture.

A feature of the work which alone is well worth the price is the wealth of magnificent illustrations, of which there are 559, all original. These will be found of great assistance in understanding the steps of the various operations. A. R. ALLEN.

#### AMERICAN TEXT-BOOK OF SURGERY.\*

THE great popularity attained by previous editions of the American Text-Book seems likely to be continued to the fourth edition, just published. The successive revisions have done much to eliminate the inequality necessarily attaching to various portions of a work by several authors, and the present edition is singularly uniform in character. As was demanded by the progress of the recent past, much of the work has been extensively recast. Among these Surgical Bacteriology and the Surgery of the Nerves, Joints, and Abdomen are conspicuous. Edebohl's operation receives ample attention, Monk's intestinal investigations are fully considered and Matas' studies on neural infiltration and aneurism are well brought out. The new chapters on Military Surgery, Naval Surgery, and Tropical Surgery, are of especial interest to military surgeons, and contribute much to the value of the work for campaign service. The fact that these chapters are printed in smaller type than the rest of the book would indicate an impression on the part of the editors that military and naval officers enjoy better sight than their civilian brethren, and we hasten to assure them that army and navy doctors are quite human and entirely subject to the ills that affect the rest of humanity. It is quite convenient to include the discussion of organization, equipment, and sanitation in chapters on military surgery, and this plan has been continued in this present work. It does not appear to the writer that this

\**American Text-Book of Surgery.* For Practitioners and Students. Edited by WILLIAM W. KEEN, M. D., LL. D., F. R. C. S. (Hon.). Fourth Edition, Thoroughly Revised and Greatly Enlarged. Handsome octavo of 1363 pages, with 551 text-illustrations and 39 full-page plates, many in colors. Philadelphia, New York, London, W. B. Saunders & Co., 1903.

is any more appropriate here than with other portions of a surgical treatise, and it is suggested that the occupation of the space, now taken up by it, by fuller discussions of military surgery proper is worth taking into consideration in future editions. Aside from this, both the military and naval sections are models of their kind and add vastly to the value of the work. In the section on Tropical Surgery, from the pen of an accomplished member of the Association of Military Surgeons, the profession has an accurate, well-digested and succinct guide to surgical practice in the tropics, the advantage of which will appeal strongly to medical officers serving in our island dependencies.

#### INTERNATIONAL CLINICS.\*

THE third volume of this thirteenth series of the International Clinics maintains the high standard of the previous volume. It contains a symposium on diseases of the gall bladder and gall ducts which treats of the subject from a medical as well as a surgical standpoint. The papers are from eminent teachers and authorities on the subject. A number of valuable articles under the heading of Medicine, Surgery and Treatment are given. One that especially deserves more than ordinary consideration is Malarial Infections: their parasitology, symptomatology, diagnosis and treatment, by Lieutenant Charles F. Craig of the Army. The other articles are also valuable and will bear careful reading.

A. R. ALLEN,

#### A NARRATIVE OF MEDICINE IN AMERICA.†

THE history of medicine in America has long been awaiting a pen which should show it forth in the sturdy tones which its virility would justify, and in the quill wielded by the facile hand of Dr. Mumford, the want would seem to have been

\**International Clinics, A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles.* Edited by A. O. J. KELLY, M.D., with a distinguished corps of collaborators. Thirteenth Series. Vol. III. Large 8 vo; pp. 306. Philadelphia, J. B. Lippincott & Co., 1903.

†*A Narrative of Medicine in America.* By JAMES GREGORY MUMFORD, M.D., 8 vo.; pp. 508; Philadelphia, J. B. Lippincott Co., 1903.

amply filled. He modestly disclaims the writing of a systematic history, professing simply to aim at a series of notes on the lives and doings of some of the conspicuous American physicians of each era. But what is history but a rehearsal of the lives and doings of men? As a matter of fact, the author has given us history, reliable and accurate history, but told so charmingly and withal so simply as to be irresistably attractive. In military medicine he refers to Church, mentions Craik, sketches Tilton, Lovell and Lawson and treats fully of Morgan and Shippen. The work is about evenly divided between the ante-nineteenth century period and the first fifty years of the nineteenth century itself, and closes with an admirable chapter on some tendencies in modern medicine.

#### THE NEWEST DUNGLISON.\*

THE *magnum opus* of Professor Dunglison's long and useful professional life has made so many re-appearances upon the stage of professional endeavor, that it might be excused if it were to have become a little staid and old-fogyish with the lapse of seasons. But it opens the twentieth century with its twenty-third edition and as modern and up to date as if it had in truth quaffed freely of the fountain of youth. Those familiar with Dr. Stedman's work as editor of the *Twentieth Century Practice* and as associate editor of the *Medical Record* will be prepared for the careful editing of the present edition. Dunglison was always a polyglot and rendered recourse to the foreign medical lexicons rarely necessary. This feature is retained in the present edition in connection with many other characteristics contributing to render this volume as useful to the student and practitioner of the twentieth century as its predecessors were to the successive generations of the nineteenth.

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\***A Dictionary of Medical Science.** By ROBLEY DUNGLISON, M.D., LL.D. Twenty-third Edition. Revised by THOMAS L. STEDMAN, A.M., M.D. Roy. 8 vo.: pp. xii, 1212. Profusely Illustrated. Philadelphia and New York, Lea Brothers & Co., 1903.

# Enno Sander Prize Essay, 1903.

## THE DIFFERENTIAL DIAGNOSIS OF TYPHOID FEVER IN ITS EARLIEST STAGES.

By MAJOR FREDERICK SMITH, D.S.O.,

ROYAL ARMY MEDICAL CORPS.

DIPLOMATE IN PUBLIC HEALTH, DURHAM UNIVERSITY; SANITARY OFFICER  
FOR IMPERIAL TROOPS WEST AFRICA; FORMERLY ASSISTANT IN  
PATHOLOGICAL LABORATORY, ARMY MEDICAL SCHOOL, NET-  
LEY; EX-MEDICAL OFFICER OF HEALTH, PENANG.

### Chapter 1.

#### INTRODUCTORY.

**N**O more important subject than that denoted by the title of this essay could have been selected. Early recognition is of the utmost importance from the point of view of treatment. Experience has shown that, in a general way, the earlier the stage in the disease at which we commence treatment, the greater is the patient's chance of recovery.

But there is another and a much more urgent reason for endeavoring to ascertain as soon as possible whether or no a patient be suffering from Enteric Fever. So long as the malady has not been identified, no steps will be taken to prevent the spread of the disease to others. Knowing, as we do, that the so-called ambulant case is very common, we can see that an infinity of harm may be done by one infected man before his complaint has been diagnosed, if indeed it ever be diagnosed. Delayed treatment affects of itself the life of one man, delayed recognition of the nature of the disease affects many lives. It is more particularly in private practice, as distinguished from hospital work that so much harm can be done by failure to diagnose the illness. In a good hospital all cases of fever are regarded with suspicion, and, until finally diagnosed, are treated as though they had been pro-

nounced to be typhoid. In military life the ambulant case is of the highest importance. As a mere matter of observation, unsupported by figures, I should say that it is much commoner in military than in civil life; why, is hard to say. I have had personally to deal with typhoid epidemics among soldiers. In the course of this duty I have seen a trooper in maniacal delirium dragged in to hospital by four of his comrades. He died within 24 hours, and the post mortem examination showed that he was in a late stage of typhoid fever. Another was brought in comatose from supposed sunstroke, and a third was taken off his post as a sentry by order of a passing doctor.

One man had been sent up for examination by his C. O. who found that he was looking ill. He smoked a cigarette and read a comic paper while the Hospital Sergeant took his temperature. It was 103° F. He asked the Sergeant to say that the thermometer registered 98.4 so that he might not have to come into the Hospital. However, he was taken in and he died within 48 hours of perforation. A friend of mine did a long day's shooting in a hot country a week before his death. His end came about as follows: He had not been feeling well for a few days, and a companion persuaded him that it was for want of strengthening food. The unfortunate sick man took his advice, made a hearty meal of half a chicken, and within 2 hours was seized with a sudden pain and distension of the abdomen, due to a perforation which ended his life. Lastly, let me say that I have when making ordinary medical inspection of troops during a severe epidemic, repeatedly picked out men who had enteric, and who knew it not. I am not sure of the exact highest number singled out in any one weekly inspection, but think it was 6 (out of about 1000 men). Why soldiers should be different to other people in this matter, I cannot pretend to explain satisfactorily. In a good regiment the men think it their duty never to go into hospital unless they are absolutely unable to do their duty, and this might account for some of the cases. By a fallacious style of reasoning too, the men sometimes get an idea during an epidemic that the hospital is a very unhealthy place to enter. They arrive at this notion from observation of the fact that many men die in hospital, In

consequence they do not seek medical advice if they feel only a little unwell, because they fear that the military surgeon may exercise his power of making them go into hospital, whether they like it or not.

So then, we see that the early detection of typhoid is of great importance in military life as well as in civil life. In the matter of causing danger to others, the military case is the more serious, owing to the impossibility in camps of carrying out sanitary measures as effectively as in towns and villages. A camping ground is always fouled by the urine of the men and generally also more or less by faeces. The flies too, (and these insects have been shown to carry enteric infection) are more in evidence in camps than in barracks; moreover they have easier access to faecal matter in the necessarily more or less open camp latrines than in the modern sanitary conveniences of houses.

With regard to a right interpretation of the title of the essay—Are we to deal with the case of typhoid fever in the early stage of the disease itself, or are we to adopt the wider view and give the differential diagnosis of the disorder in the earliest stages at which it comes before the medical officer? Or, again, is it to be taken to mean the earliest stage at which it is possible to diagnose the disease? As I have already shown the patient does not by any means always come before the doctor in the early stages of the disease. The diagnosis in the later stages has, however, been already so much written of that there seems to be little more to say, and I shall therefore confine my paper to the diagnosis in the beginning of the fever, about the first three or four days, that is.

It will be convenient to treat of clinical manifestations alone in the first place; and when I have finished with them I shall describe bacteriological methods of diagnosis. I begin purposely with the clinical conditions for two main reasons, 1stly, Because they are the more immediately available for the diagnostician's aid, and have in many instances to be relied on entirely; 2ndly, I consider that there is too great a tendency now-a-days to disregard the wisdom which came to us empirically and which has been handed down with successive additions from generation to generation. A really clever physician of the old school will often achieve more

without the microscope than a less astute modern medical scientist will do with it. Year after year new facts come to light which show that the bacteriological methods implicitly relied on a few years or months before, were unworthy of the faith reposed in them.

In no direction is this more evident than in the literature of the disease, which is the subject of this Essay. It is indisputable that the colon bacillus has been mistaken for the typhoid organism time after time. Serious errors have thus been made; not only has the sanitary officer been put off the track of the disease, but dairy keepers, aerated water sellers, oyster dealers, and so forth have been made to suffer in reputation and pocket when they in no wise deserved to. Major W. H. Horrocks, R.A.M.C., in his work on the technical analysis of water, has demonstrated clearly enough how erroneous were and are some of the conclusions drawn from cursory examination of water.\*

In the following pages I write to qualified physicians, I shall therefore omit such details as are the common knowledge of physicians with regard to diseases generally.

## Chapter 2.

### SUBJECTIVE EARLY SYMPTOMS OF ORDINARY TYPHOID. AUTHOR'S EXPERIENCE OF THE DISEASE IN HIS OWN PERSON.

Having myself suffered from an attack of typhoid fever, an attack, moreover, which was not recognized until the end of the third week, I cannot do better than give an account of my own experiences during the first days of my illness.

The earliest sensation was one of not feeling up to the mark, as we say—an ill-defined feeling of depression. Then a chilliness was felt and I thought I'd caught cold. So sure was I of this that I tried to bring on a sweating by taking a brisk run for a couple of miles into the country, but to little purpose. A medical friend gave me 15 grains of Dover's powder that night. He evidently saw nothing much wrong with me. The third morning I was feeling more miserable and had a nasty taste in the mouth.

\*Bacteriological Examination of Water. Major Horrocks. London. J. & A. Churchill, 1901.



At breakfast food seemed bitter and nauseating, so that I could with difficulty force myself to swallow a morsel. All this time my temperature was not taken. The next day I went off with a small detachment for a short journey. I have, of course, a vivid recollection of that period. I ate nothing absolutely and had only tea and water to slake the inveterate thirst. Almost every time I drank these things, they came up. I was able wearily to look after myself as far as getting settled down for the night, etc. I now had diarrhoea. Absolute indifference to my fate possessed me. I used to sit, during the day's march, in a disconsolate heap on the tail of a wagon, head supported for hours on the hard narrow edge of the back rest, mouth half open and a host of flies buzzing about it. I suppose nervous sensibility was blunted, for though at ordinary times I am rather what is called ticklish, I was able to endure the presence of scores of flies on my lips, and had not energy enough to drive them off. A non-medical friend was never tired of wondering how I could endure these flies, and used to watch them with a mixture of astonishment and disgust. I mention all this to show how utterly misleading one's own sensations are as a guide to diagnosis of sickness. At the end of this tedious journey I turned into my tent and it was not until the following morning, when a doctor happened to see me, that I knew I was really ill. I was much surprised to find myself an object of solicitude and anxious care. My feeble protestations that I was nearly all right again were, of course, taken no notice of, and whether I would or no I was put into bed.

The idea of the reader if he has not had much experience of typhoid, except under the civilized roof, will be that the first doctor who saw me was a fool. He may have been. If so, I must admit that I have since often been as much of a fool as he was, and that in spite of my painful experience. Since that time I have twice been put into bed on suspicion of having enteric, and on another occasion I had a six days fever and slight diarrhoea while at my duty in an enteric stricken camp. In one of the two attacks alluded to, I was suffering from a malarial reminder, under the influence of sun and fatigue. I have no idea what was wrong on the second occasion. I got up to work on

the fifth day, though feeling rather weary. My chart was very like the beginning of typhoid. The reader may say that it was probably an abortive attack. I may say that my first real typhoid and these other three illnesses occurred on active service, when the disease was rife among the troops. No means of bacteriological diagnosis were available. As far as my own sensations go, all these illnesses were much alike in onset.

As they appear on paper, my early symptoms were certainly indicative of nothing in particular. What I appeared like to others, of course I cannot tell. Evidently I did not look very ill, or it would have been noticed. I know that my tongue must have been foul, because I can remember the mouth taste now. I know that my skin was dry, because I noticed it at the time and in the first mentioned attack, tried to bring on sweating. I assume that it was warmer than normal to the touch. My pulse, I suppose, was accelerated and my face a little drawn and pallid. But I was sunburnt and pallor would be somewhat hidden.

From my experience of the disease in person and from an extensive study of cases, I have come to the conclusion that the subjective symptoms in the early stages of typhoid are almost valueless from the positive point of view in differential diagnosis. All you can rely upon is a statement from the sick man that he feels ill and has no appetite. This is the condition we call malaise. The patient may complain of a headache, a chilliness, "pains all over," stomach ache or diarrhoea, but these are by no means constant. Still the very absence of definite symptoms of illness in any particular organ, while at the same time the patient is obviously ill, will suggest typhoid fever. The age of the patient is of some value at Home, but when a severe epidemic prevails, it may be almost disregarded. During the Boer war no age was exempt.

### Chapter 3.

#### OBJECTIVE SYMPTOMS.

The objective symptoms help us much more than the subjective in the early stage of this disease. Withal these, too, are most indefinite and irregular.

I will give what I have found to be the leading indications of the disease.

At the outset I am forced to raise my pen from the paper and ponder. Why? Because I find that words in adequacy do not suggest themselves to me. And this I think must be a difficulty of all writers on typhoid fever. They have a picture in their own minds of a typical typhoid case (if there be such a thing). But this idea has been born of practical familiarity with the disease and cannot be converted into phrases. If the civil medical man finds it hard to describe early symptoms of typhoid, how much more so the military physician, who has met his cases in all sorts of climates and conditions which may modify them.

However, I attempt a description. I commence with the results of regimental health inspection. During a severe epidemic among the troops in South Africa, I had to repeatedly examine two Regiments, each being about 1000 in strength, and, as before stated, I was able to pick out some typhoid cases. In addition to this, some 20 to 30 men of each regiment reported sick every morning and afternoon. There were two sick calls daily, as a temporary measure, owing to the prevalence of the illness. The men who came sick were not all suffering from typhoid—indeed some were not ill at all, and merely wished to have a day's rest from "outposts" and "fatigues." Dysentery cases were fairly common among the troops at this time. There was also a prevalence of what, for want of a better name, we call "Camp Fever." Officially the last mentioned was returned as "Simple Continued Fever," not because the army physicians thought the disease simple, but owing to the Fellows of the London College of Physicians not having laid down in the official "*Nomenclature of Diseases*" any other term for non-specific, unrecognized, and therefore unclassified fevers.\*

This health inspection, therefore, is a good test of the obviousness of external signs of early typhoid as far as my personal

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\*The military authorities at Headquarters in their desire to use the same nomenclature as the civil profession and to satisfy the requirements of the Registrar General adhere to the disease terms in the above mentioned book. I mention this because some of the members of the very body which framed the book have tried to throw blame on the army for the present system of nomenclature.

diagnostic acumen is concerned. The examination is made in this way. The men in shirt sleeves fall in by Companies, two deep (for the benefit of the civilian reader, I may say this means that the men stand up side by side in rows).

The objects of the inspection are set forth as follows in the Regulations for the Army Medical Service, 1900 (British Army).

Para. 102. "The Medical Officer will inspect the men under his charge weekly to satisfy himself that their personal cleanliness has been attended to, and for the detection of itch \* \* \* \* and any ailments indicated by the countenance or skin, such as fever, smallpox, scurvy, etc."

The Medical Officer walks along the ranks. Here and there he feels a pulse, examines a tongue, and says, "Are you all right?" If he wishes to make further examination, he orders the man to fall out. The inspection of a regiment this way does not take much time, and is not intended to, as the men have work to do. The parade being dismissed, the men who were fallen out are examined more minutely.

I find a pale face; a tired, drawn expression, or a lack-lustre eye. Any or all of these may be evident. I feel the man's pulse; it is slightly accelerated. I look at the tongue, it is coated with a dirty white or yellowish, not very moist fur, more pronounced in the middle than the sides of the tongue. The red edges and tip, so much talked of in text-books were not the rule at this early stage of the disease. The skin may be dry or warm, but these indications, especially the latter, depend so much upon the condition of the observer's own hand, that they are quite unreliable. The man is ordered to fall out.

On more complete examination, I find that the above mentioned symptoms are not peculiar to fever as indicated by the thermometer. Half the men ordered to fall out were generally found to have normal temperatures, and subsequent observation showed that these were not suffering from recognizable typhoid. (Those who had temperatures were at once taken under observation for typhoid and generally proved to be such. The rest were treated otherwise). For all that, I hold a belief that I can make a very good guess from a man's face and tongue in epidemic times, whether he has the disease or not. For want of a better name, I might call this facial appearance the "typhoid expression," and

only long practice will enable anyone to recognize it. In singling out men on the weekly sick parade now being described, I found the condition of the tongue was of more value than any other coarse sign. But there was no malarial fever about to confuse me. Frequently the tongues of men standing in the ranks had already become brown and begun to look dry down the centre from typhoid fever.

Nevertheless, that enteric fever may be well advanced and no marked facial expression of the disease be evident (to me) is shown by the fact that 5 or 6 hours after the inspection, men who had been on the sick parade would report sick, and be found to be suffering from well-marked fever which ultimately proved to be typhoid.

What, then, are the clinical symptoms of typhoid in the first three or four days? Symptoms peculiar to typhoid and to be observed so invariably that exceptions may be held to prove the rule?

To this question I reply: One only, the elevation of the temperature. The height to which the temperature rises is in itself not diagnostic. It may be 99° F. or it may be 104. The majority of those men having a temperature of 102 or more, and having no definite symptoms of disease in any particular organ or part of the body, would in the absence of malarial cases turn out to be typhoid.

We are, then, driven to diagnose clinically by a system of exclusion. The diseases liable to be confounded with typhoid and the method of differentiating them will be found in the following chapters.

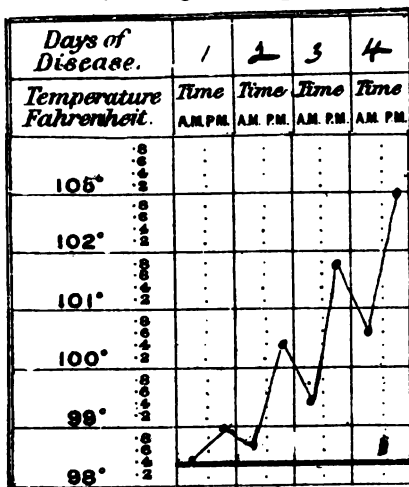
To some extent, fortunately, geographical limitations of disease aid us in diagnosis. There are, however, countries in which almost all the illnesses liable to be mistaken for typhoid (and vice versa) are to be met with. I shall, therefore, deal with the various diseases independently of geographical considerations.

Before discussing the specific diseases a short chapter will be devoted to the question of temperature and to a few special symptoms supposed to characterise typhoid fever.

## Chapter 4.

## TEMPERATURE GENERALLY AS AN AID TO DIAGNOSIS OF TYPHOID. SOME SPECIAL SYMPTOMS IN TYPHOID.

The typical typhoid temperature of the text-books is characterized by rising in a regular series of steps. There is a remission



Typical Temperature Chart of Typhoid fever was very rare in the

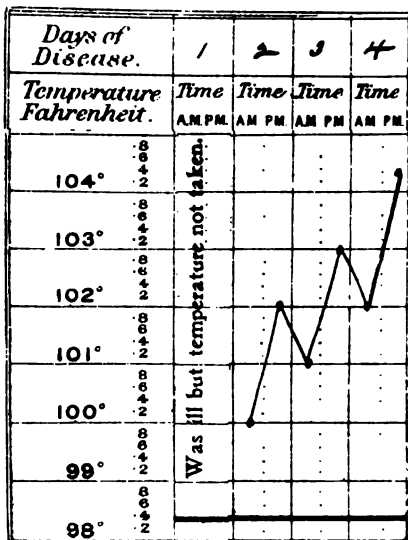
place where this fever occurred, otherwise it might easily have been mistaken for a rather violent attack of this ailment. Diagnosing by the chart alone without seeing the patient, anyone would call it typhoid. The symptoms were headache and vomiting. There was no sign of haematuria till the evening of the fourth day, and the fifth day the temperature suddenly dropped.

The third Chart is one of Malta Fever in the care of Surgeon G. E. Moffet at Gib-

of a degree or so in the morning, and an ascent of about  $1\frac{1}{2}$  to 2 degrees in the evening. The result is a gradual rise to the maximum on the fourth or fifth day.

A large number of cases do not present this typical temperature chart, and sometimes a temperature typical of typhoid may occur in other fevers.

Below is the chart of a Black Water Fever case of my own in West Africa. Enteric

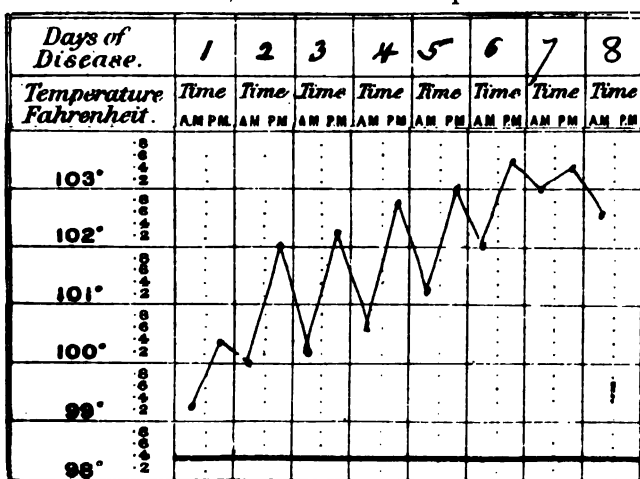


Black Water Fever.

ralter. Though not quite so typical of enteric as the two preceding, it is so like it that it would deceive most people. The fever continued for more than 8 weeks and ended in death. A postmortem showed that the disease was not enteric. There were no early symptoms for guidance beyond those common to many fevers.

Not very long ago physicians of some eminence did not hesitate to make emphatic statements as to the value of temperature as a diagnostic sign of typhoid fever. Thus, Sir William Aitken, in his "Practice of Medicine," said: "A temperature of 104°

Fahr. on the second day is not enteric fever; a temperature which is not above 102.5° F. after the evening of the fourth day is not enteric fe-



Malta Fever.\*

ver; and lastly, a patient after the first day whose temperature has been normal *once* during the first week, is not a case of enteric fever." This was written twenty years ago. Not one of the three definite statements was justified.

Temperature of itself, then, is not a serviceable guide to diagnosis of enteric fever. All the same, a typical chart is strong presumptive evidence of the disease. In a non-malarious country with temperate climate, the chances are that such a fever would be enteric. In fact, any fever with a continuous temperature ascending or irregular for four days in such a climate is suspicious if no symptoms of other diseases are to be made out. But if the

\*Army [British] Medical Annual Report, 1889. Appendix VI, by Surgeon G. E. Moffett.

case occurs in a place where other fevers prevail, malarial fever, Malta fever, or any of the various unnamed continued fevers, the case is different. For that matter, though the continued temperature is, as stated above, suspicious in a temperate, non-malarial country, it is *only* suspicious. I have seen long consultations over cases in which the difficulty was to decide that a typhus case was not typhoid, and many a clever physician has been puzzled by acute general tuberculosis. On the other hand, I have myself thought a typhoid case to be typhlitis until more extended observation revealed the real nature of the disease. However these diseases will be referred to in this connection later on.

DIARRHOEA.—Diarrhoea was at one time looked upon as a cardinal symptom of typhoid. Now it is regarded as by no means constant. On the other hand, constipation has come to be recognized as common in the disease. The truth, probably, is that the disease of the intestine affects the nervous system in one of two ways—it either causes undue irritability or it paralyzes. Normal frequency of stools therefore is not usual. The character of the diarrhoea when it does occur rather bears out this. The stools are not very frequent as a rule, but are small and loose. The bowel is not acting in the normal way, but irregularly. Large quantities of faeces may remain in the intestine, while small quantities of loose faeculent matter are extruded.

It has seemed to me, as to many others, that in hot climates the proportion of constipation to diarrhoea in typhoid is greater than at Home.

ILIAC TENDERNESS AND GURGLING.—The iliac sign I have grown to almost disregard. Undoubtedly there is tenderness in some cases, though generally of an indefinite kind. In the great majority of patients, however, it is not present. Now and again it is well marked, and the patient may even complain of a subjective pain in this region.

Gurgling in the iliac fossa is present when there is much looseness, but it is more frequently absent than not. Moreover, the sign can be elicited in nearly as large a proportion of cases which are not typhoid.

SPLEEN.—The spleen, I think, may be left out of considera-



tion in the early stages of typhoid, more particularly in malarious countries.

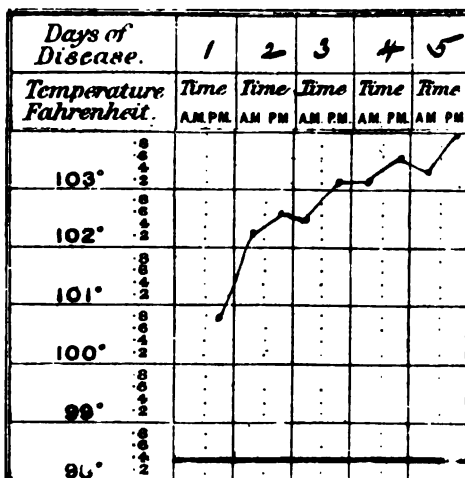
EPISTAXIS.—I may have been unfortunate in this respect, but I have not found epistaxis common enough in enteric to be of much use diagnostically.

## Chapter 5.

### TYPHUS FEVER. RELAPSING FEVER.

TYPHUS FEVER is now so uncommon that a good many medical men have never seen a case. Hence the diagnosis is of less importance than it used to be. On the other hand, owing to its comparative rarity, it is likely to be overlooked. Here is a chart of a mild case of the disease the only form liable to be mistaken for typhoid.

The special character of the typhus chart is the absence of a marked morning remission. The temperature alone is, however, a poor guide in this disorder. The early



**Typhus Fever.**

appearance of the rash is of value. It is usually evident by the fourth day. A characteristic copious measly eruption would preclude typhoid, but very frequently the eruption is neither copious nor measly, differing scarcely at all from typhoid. There is then, only this early appearance to guide us. A good deal, therefore, depends on the history. For if an ambulant typhoid only came in two or three days before the eruption stage, and the eruption were at all like typhus, doubt might arise. I have seen once or twice a copious typhoid eruption with flaky patches like typhus. The bowel symptoms are of no value in a great number of cases in the early stage, though of course diarrhoea with pale stools suggests typhoid.

The most distinctive things about the typhus case in the few patients I have seen with this disorder, have been the flushed skin; suffused eyes and mental confusion.

The disease is rare among British soldiers. I have only seen one Army case. It occurred in a country where typhoid was very prevalent, and it was at first diagnosed typhoid.

By careful attention to the above points a diagnosis may usually be arrived at, but in a proportion of cases definite differentiation is impossible in the early stage if clinical grounds only are relied upon.

RELAPSING FEVER is now never seen among European British soldiers. But this may be because we have had no European wars. In the Crimea, cases occurred among the British troops (Aitken), and only 30 years ago it was noticed in London and other large towns. Ireland in famine times was one of its strongholds. All the same, I think its prevalence among European troops is such a remote contingency that we need not spend much time discussing it. In East Indian campaigns it has appeared sometimes among the camp followers. In any case it is more likely to be mistaken for typhus or malaria than for typhoid. The invasion is sudden, pain in the back marked, the tongue covered with white fur. The disease is always epidemic and invariably among the poor and ill-fed. The British Army in its first Crimean winter had been reduced to a poor and ill-fed condition. The detection of the spirillum of Obermeyer would settle diagnosis, but unfortunately in time of serious warfare the microscope is apt to be of necessity neglected.

### Chapter 6.

#### TUBERCULOSIS, DISEASES OF RESPIRATORY SYSTEM AND INFLUENZA.

TUBERCULOSIS as a systemic invasion apart from pneumonia, is very liable to be mistaken for typhoid. The converse is not to be expected, except with respect to children. Sudden onset of general tuberculosis with considerable fever is not common among European British troops, but among our British negro troops this form of tubercular disease is frequent. The negroes referred to are the civilized descendants of slaves in the West Indies. The

same predilection to tubercle has been noticed by American physicians as existing among the negro population of the United States. The subject is therefore important to the great English speaking nations, for they both employ negro soldiers. Among our British West African Regiments of natives the tendency to tubercle is not marked, whereas the West Indian soldier serving in West Africa still retains his liability to the disease. In my own practice I have known them die of tuberculosis without presenting any pulmonary lesion recognizable clinically or on the post mortem table, and in one or two cases the lungs show no naked eye appearances of tubercle at the necropsy, though the involvement of other organs, as the spleen, pericardium, liver, etc., enabled a correct diagnosis to be made. Not infrequently these cases were in the first instance thought to be malarial.

Clinically acute general tuberculosis is indistinguishable in the first few days from typhoid with an irregular temperature.

The fever is generally of the brisk type and the face is somewhat flushed, in contradistinction to the pale, drawn expression on the typhoid face. The tongue is inclined to white fur, rather than to the dirty central fur of typhoid. But after all, there are not very marked differences, and in the negro the facial indication is of even less value. There is an aid to diagnosis to be mentioned presently, but clinically and without bacteriological assistance, there is really nothing for it but waiting.

Further reference to tubercle is made under the head of Pneumonia.

**PNEUMONIA.**—I have just been to see a case belonging to a country practitioner. The patient, a military pensioner, has been ill about three weeks. The medical attendant relying on clinical evidence only has not yet definitely decided whether the man has tuberculosis or typhoid, or both. I was not able to come to a final decision, though I believed the case to be typhoid. This patient had definite lung lesion. That is to say he had pneumonia after two or three days illness. Evidently if tuberculosis, the disease was not acute, inasmuch as the lungs are almost all right again. But there is a consolidated patch in one apex. It is probably a case of enteric fever with pneumonia, and it is

quite possible that secondary tubercular mischief is now beginning. This man was taken ill away from home and the doctor who saw him at once pronounced the illness to be pneumonia (which of course it was) and he treated it accordingly. The patient came along home against the doctor's advice. As far as I know there is no clinical difference between the pneumonia of enteric and that due to other diseases. Indeed, it is still debated whether the pneumonia of enteric is a secondary disease, due to the pneumococcus and merely predisposed to by the first disease—the occasional recovery of enteric organisms from the sputum and lungs notwithstanding. That the pneumococcic lung inflammation is likely to be mistaken for typhoid as well as the converse is clear from the last report of the Metropolitan Asylums Board of London. In the Isolation Hospitals of the Board in 1901 no less than 86 cases of ordinary pneumonia were wrongly diagnosed and sent in to hospital as enteric fever.

Primary acute lobar pneumonia from enteric is not common. Therefore there seems to be no justification for identifying such a case as enteric, on clinical evidence only, until the lapse of time has confirmed the diagnosis. It would, though, be a wise precaution to treat such cases in the "doubtful ward," as enteric, until they had been shown not to be, especially in the case of persons of the most susceptible age for typhoid and during epidemics. When slight fever has existed for two or three days before the onset of pneumonia, the probability is that the case is enteric.

Capillary or broncho-pneumonia might be mistaken for enteric, inasmuch as a slight capillary bronchitis is a common accompaniment of enteric. But when due to the latter disease, the bronchitis is not often met with before the end of the first week. The primary affection as in the lobar inflammation ought not to be regarded as enteric on clinical evidence alone.

BRONCHITIS accounts for 8 cases admitted in error into the Enteric wards of the Metropolitan Asylums Board Hospital in 1901. Presumably they were of the capillary variety. The remarks made under broncho-pneumonia apply to them. An ordinary bronchitis of the larger bronchi could not in the hands of a reasonably careful and astute physician be mistaken for typhoid.

**INFLUENZA.**—In the Metropolitan Asylums Hospitals in 1901 there were 13 cases of Influenza admitted to the Enteric wards. In the presence of an epidemic of influenza, the numbers would probably be increased at first, but when the influenzal epidemic had become generally recognized, the tendency would be in the other direction, and enteric attacks would be ascribed to the milder disorder. I have myself sent a soldier into hospital for influenza, when he really had enteric. Still, a typical influenza, one would think, ought to be recognized—the sudden onset, violent frontal headache and pain in the eyeballs, the rheumatoid pains, tightness of chest and throat, the sthenic fever and sometimes the catarrh, (I say sometimes, because in the epidemic of twelve years ago in Aldershot camp it seemed to me that noticeable catarrh was not the rule). But when an enteric begins with headache and pain in the eyes, differentiation is less simple. Moreover, the symptoms in influenza are frequently less marked than those above noted. Nevertheless by waiting till the fourth day, most cases will be decided by the drop of the temperature and the sudden disappearance of the urgent symptoms. The typical cases of either complaint will be recognized by any moderately skilful clinician—where the symptoms are atypical judgment must be suspended. The absence of signs of local mischief is common to both maladies.

### Chapter 7.

**MENINGITIS, SEPTICAEMIA, PUERPERAL FEVER, PYAEMIA, ENDOCARDITIS, PERICARDITIS, GLANDERS.**

**MENINGEAL TYPHOID** is not very common compared with tubercular meningitis, but it is met with from time to time. An illustrative instance occurred in my practice a few months ago. The patient was 30 years of age and had a history of family predisposition to tubercle.

He was a delicate looking, thin man. When first seen he was pale, had an alternating strabismus, and lay with his head retracted. Headache was severe. He had no abdominal symptoms. Appetite completely gone. Tongue dirty brown, but not much furred, not red at edges or tip. Breath offensive. Constipation. He could not sleep and was very restless. Obviously he

was suffering from meningitis in a not very acute form. Kernig's sign was not marked, but he had much pain in the stump of his amputated thigh. The rarity of primary tubercular meningitis in adults caused me to suspect typhoid. The temperature was not typical, but did not contra-indicate typhoid. He was therefore treated for both diseases. It was not until the appearance of eruption, typical stools and the abatement of the meningeal symptoms that typhoid was declared. The man is now quite well. Bacteriological methods were not resorted to and I do not see how without them diagnosis could have been made with certainty in the early stage. A diagnosis of brain fever would have satisfied the man, who thought he had been overworked, and a marvellous recovery might have been recorded. Many reputations are made by such easy means combined with avoidance of post-mortem examinations in those cases which do not terminate so favourably.

A well-marked case of meningitis, then, is most likely to be tubercular, but the possibility of its being typhoid must be held in view. As a rule the typhoid meningeal inflammation is of the less severe kind, and may be preceded by the typical typhoid temperature. In both varieties, however, the head symptoms are apt to come on after a few days preliminary fever.

In EPIDEMIC CEREBRO-SPINAL FEVER the epidemicity itself will be a clue to the later cases, but the first case or two may not be easily differentiated. When the disease comes on suddenly and violently, with irregular high temperature, injected eye, squint, intense headache, cerebral vomiting, pain in the muscles of the back of the neck and retracted head, the diagnosis of cerebro-spinal meningitis may be made with some confidence.

When there is a preliminary stage of fever with less sign of meningeal mischief, we should reserve our opinion in this as in the other forms of meningitis.

In the epidemic form the disease appears now and again in armies. It broke out among the Soudanese troops at Khartoum a few years ago. On the Gold Coast not long since it attacked the negro carriers employed in the British service for transport work.

SEPTICAEMIA AND PYAEMIA have been mentioned by some writers as liable to be mistaken for typhoid. Such cases must be very rare, except perhaps in puerperal fever. I have had no personal experience of blood-poisoning in this connection. The history of the case, the local mischief, the intermittent nature of the fever, the sweating, etc., ought to point at once to the real nature of the disease.

It must not be forgotten however, that typhoid may occur during the puerperium or in persons suffering from an injury or conditions liable to give rise to septic poisoning.

ENDOCARDITIS, or acute rheumatism of the heart, is so rarely idiopathic and unattended by local signs that it seems unlikely to be compared with typhoid. I had one case of a soldier who for three days had irregular fever, a white furred tongue and headache. His unusually rapid pulse called attention to the circulatory system. He then said he had slight heart pain or uneasiness and palpitation. Auscultation revealed a soft murmur. The man's face was flushed and he had acid sweats, but no rheumatic pains. I can't say that I thought this was a typhoid case though the possibility was discussed before the local symptoms had revealed the true cause of the fever. The correctness of the diagnosis was confirmed by the subsequent events—treated with Sodii Salicylas the fever abated and the man became convalescent. He got about too soon and his medicine was neglected. Three or four weeks later he had a relapse and developed typical Rheumatic fever with joint lesions.

Painless Pericarditis might conceivably give rise to the question of typhoid, but in this as in endocarditis, stethoscopy would determine the case during the first two or three days.

MALIGNANT OR ULCERATIVE ENDOCARDITIS has been called typhoid fever in error. The real nature of the malady may generally be inferred from the history of disease likely to be followed by this fatal disorder. Sometimes there is no history. The sudden severe rigor at onset, followed by fever, profuse sweating and perhaps another rigor, with the same sequence of symptoms on succeeding days should turn the physician's thoughts in the

right direction. On the third or fourth day there will almost certainly be cardiac mischief recognizable by the stethoscope.

GLANDERS.—A man comes to you complaining of chilliness and headache, pains in his limbs, loss of appetite of two or three day's duration. You find he has a temperature morning and evening, a dry skin, quick pulse and foul tongue. He is restless, sleepless and constipated. If he is a groom or stableman and shows you a wound (open or newly healed) with erysipelas around it, the lymphatics of the part reddened, hard and having little nodules at intervals, the neighbouring glands swollen, you will suspect glanders. If he has an eruption of shot-like yellowish red papules on the face and trunk, and also has a nasal catarrh and a painful, tender and swollen nose, you will be convinced that you have a case of glanders. But if a man with the constitutional symptoms only, presents himself to you, or perhaps with these and the nose affection, you will not think of glanders unless the patient himself puts you on the right track by the history. Even then you will only have a suspicion of the cause. If you can find the Glanders bacillus in the nasal discharge, you will decide the nomenclature; otherwise, you can only wait.

### Chapter 8.

#### GASTRO-ENTERITIS, INFLAMMATION IN THE NEIGHBORHOOD OF THE CAECUM, DYSENTERY.

The early symptoms of ACUTE GASTRITIS in children simulate typhoid fever. In adults the same thing occurs sometimes. Senn, in his book on the Spanish-American War, speaking of the Porto Rico operations, gives a list of final diagnoses of cases sent in to the Base Hospital. Among these are a small proportion of gastric fevers. The tenderness over the stomach, the vomiting, the bright red tongue, the sudden rise of temperature, the diarrhoea with foetid stools, will suggest gastritis in children.

In the less acute gastro-intestinal catarrh, the tongue may be foul and the bowels loose. The accompanying fever, except in children, is slight and irregular.

In gastric cases there is usually more colicky pain than there



is in enteric fever. A proportion of cases are bound to be held over for a week or more before a final pronouncement is made.

TYPHLITIS would seem to be unlikely to be mistaken for typhoid fever. The marked local symptoms, sudden onset, lower temperature, combined probably with vomiting, are clues to the diagnosis. But typhoid fever with early and marked pain and tenderness about the caecum may be named typhlitis as before stated. I once made this error. A few days suffice to clear up the case.

DYSENTERY.—It may be a matter of astonishment to some of my readers that any medical man could fail to differentiate between dysentery and typhoid fever.

The text-books on medicine do not recognize the likelihood of such a contingency. Nevertheless that error may arise is proved by my own experience in South Africa. Still, I think the man who could make such a blunder must be exceptionally wanting in diagnostic acumen. Some of the erroneous diagnoses were no doubt due to laziness or overwork on the part of the doctors. A man who had diarrhoea and abdominal pain would say that he had dysentery, and the doctor without further enquiry would agree with him. A more excusable cause of error arises when a man on his first appearance before the doctor is in a late stage of enteric, verging on perforation and suffering from diarrhoea with some melaena, but even here, careful enquiry would elicit the truth.

In the earliest stages the diarrhoea, straining and above all the colicky pain low down in the centre of the abdomen, just above the pubis that is—point so definitely to dysentery that it seems incredible that a careful physician could come to any other diagnosis.

I have no record of dysentery diagnosed typhoid, and can not call to mind any such, though I have no doubt they occur. The cases were the other way about. The last one was sent to the tents under my care in a General Hospital in the Transvaal. He had been under treatment for some time and had come with a large sick convoy a long distance by train from the front. The diagnosis was altered to enteric with perforation a day or two

after he reached the General Hospital. The necropsy confirmed the second diagnosis. While under my care it was not much like dysentery. I imagine the previous medical attendant had not inspected the stools. The neglect to do this is, I think, one of the most frequent causes of error in diagnosis.

The temperature of itself is of great diagnostic value in early dysentery. Instead of being above normal, it is commonly sub-normal for the greater part of the day, and if it rises in the evening it is usually only 99°, sometimes 100°, rarely more.

The fever of dysentery is said, however, to sometimes precede the local symptoms. In such a case there might be doubt for 24 or even 48 hours, but not for longer. A fever which lasts for four days without local dysenteric symptoms is not dysentery.

If the patient subsequently develops dysentery, it must be concurrent. This possibility must be remembered. In a field army with typhoid and dysentery, endemic and epidemic together, there will always be a number of men who have the diseases together.

In conclusion, as regards dysentery, let me repeat that the most distinctive diagnostic symptom is the position of the pain in the abdomen—the subjective pain. There may be tenderness, but less constantly. Typhoid colic is not felt in the lower part of the abdomen, but around the umbilicus.

## Chapter 9.

### FEBRICULA, OR SIMPLE CONTINUED FEVER.

This is the greatest stumbling block of the physician. For one of all the diseases I have mentioned, there will be a dozen febriculas confused with enteric fever.

I have already mentioned that the name "simple continued fever" is only a meaningless term forced upon us. A refuge for the ignorant it is, and nothing more. For no fever can be simple in the sense of being without cause or effect. All the same, I beg to subscribe myself one of the ignorant in need of a refuge, though I should have preferred a less absurd nomenclature, such as for instance, "Fever (type)—nature (or cause) unknown."

In the British army in the United Kingdom in 1892 there

were 378 admissions for Simple Continued Fever.\* In Bengal in the same year there were 2,278. In Madras, 819, in Bombay, 1091. It is the same throughout the British army stations, thus Egypt 372, South Africa 167, West Indies 47, Bermuda 15, Cyprus 55, Malta 1369, Gibraltar, 78, Straits Settlements 135, China 5, Ceylon 84, and so forth. In every station the cases returned under this heading outnumbered those recorded as enteric.

A greater number would appear were it not that other refuges exist, such as malarial fever. A large proportion of the cases in Malta and Gibraltar were no doubt Malta Fever, which was at that time not allowed to appear in official returns. Influenza also, accounts for many in the United Kingdom. Others are no doubt, mild cases of Enteric Fever. It is a usual thing that men are admitted with Simple Continued Fever and the disease is changed to Enteric when definite symptoms appear. In war the cases often pass out of hand before there has been time to decide to alter the term.

During the late Boer war there were thousands of admissions for Simple Continued Fever.

The text-books lay down symptoms of Simple Continued Fever or febricula. We are told that there is headache, slight fever, dry skin, thirst, anorexia, slight deafness, quickened pulse, a furred tongue, and sometimes general pains. The temperature rarely exceeds 103 and the rise may be gradual or irregular. Whether there is or is not such a disease as febricula is beside the question, but the symptoms above detailed apply also to enteric fever. How are we to eliminate the cases which are really enteric? I assume every effort has been made to find a local cause for the fever.

In a general way it may be said that the febricula is an obviously less severe disease than typhoid. The patients do not look ill enough for the latter disease. And that is about all that can be said.

Many cases will end uncertainty by dropping to normal or subnormal temperature. The symptoms will clear up and the patient be convalescent by the fourth or fifth day. †Prof. Mac-

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\*Army Medical Annual Report (British) 1892.

†Diseases of Tropical Climates, W. C. Maclean (Macmillan & Co.)

lean said of febricula:—"The diagnosis is not difficult. The rapidity with which the temperature attains its maximum, the brief duration of the febrile state, and the absence of the progressive weakness preceding the rise of temperature, mark it off from enteric fever."

This optimistic statement is only relatively true: A good deal depends on what is meant by "brief duration." In England there are plenty of private and hospital physicians who maintain that every continued fever of seven days duration without definite symptoms pointing to any other specific illness, must be enteric. Though not absolutely true, this last statement is practically not far wide of the mark as regards the United Kingdom. But in tropical and sub-tropical climates it is not at all reliable. After all, we cannot be quite sure that the four or five days fever is not sometimes mild typhoid, especially if it occur in a man who has suffered from a previous attack of typhoid. It is a fact that typhoid of even short duration always leaves the patient debilitated and anaemic out of all proportion to the severity of the fever; but this fact is of no account in diagnosing typhoid fever in the earliest stages.

At one post in the north of the Transvaal, mild cases of continued fever with no very marked symptoms, not very high temperature and absence of the look of profound illness so often noticeable in typhoid, were so common that the very number of them strengthened us in the opinion that they were not typhoid. The temperature, though never high—rarely above  $102^{\circ}$ —often went on for so long as seven or even more days. The patients then went out of our sight towards the base in sick convoys. But I understand that many of them got quickly well and were not diagnosed typhoid. The last named disorder was prevalent among the troops at the Station. In reply to my enquiries as to the final diagnoses of our cases, the officer of the Royal Army Medical Corps commanding the General Hospital to which the cases had been sent wrote that our Camp was "amongst all the Stations from which this hospital has been getting sick, remarkable for the number of cases:—

"(a) Of enteric.

"(b) Of ague.

"(c) Of pyrexiae of undetermined nature."

I may say that class (c) remained and remain undetermined.

The position, then, with regard to febricula (excluding fevers which are typical of typhoid from the outset) is this:—

1. With care a great many febriculas may be forthwith relegated to classes of disease other than typhoid.
2. A considerable portion of them will diagnose themselves by recovery within four days.
3. A great part cannot be accurately determined on the strength of clinical conditions alone, without a longer period of observation than four days or even than a week.
4. All febriculas must be regarded with suspicion until their innocence has been proved.

## Chapter 10.

### MALTA FEVER.

Few diseases have been more mixed up with typhoid than Malta Fever. Until David Bruce, a medical officer of the British army (now Lieutenant Colonel R.A.M.C.) discovered the specific organism of Malta fever, the malady was held by many medical men to be a form of enteric. For that matter some physicians conversant only with the clinical side of the question, continued to hold this belief for some years after the publication of Bruce's researches, and this notwithstanding that many clinicians had pronounced Malta fever to be a distinct affection long before Bruce's discovery—among others three army men—Notter, Marston and Veale.

M. L. Hughes (Surgeon-Captain, A.M.S.)\* who wrote the most complete account of Malta fever, said, "In typical uncomplicated cases, confined to bed, there is usually a premonitory stage of low spirits, mental worry, sleeplessness, anorexia, with dyspeptic symptoms with headache and slight pyrexia each evening. The temperature next rises gradually, remitting each morning about half the amount of the previous evening rise. With this are combined slight headache, pains in the neck, back and limbs; moist furred tongue, swollen and indented laterally, a bad taste in the mouth, epigastric tenderness and constipation." He notes that the temperature soon reaches 103–105° F. and is

\*Undulant, Malta or Mediterranean Fever, M. L. Hughes. (Macmillan & Co., London) This talented Army Surgeon was killed in action at Colenso.

accompanied by some bronchial catarrh or hypostatic congestion of the lungs. The above refers to the ordinary, not very severe cases.

With regard to differentiation from enteric fever, he is very indefinite, and seems to think it hopeless under a fortnight and then very difficult.

\*Bruce, the discoverer of the Malta fever coccus, says: "A severe, rapidly fatal case of Malta fever cannot be distinguished from a similar case of typhoid except by post-mortem examinations \* \* \* \* \*"

In places, then, where both Malta fever and enteric are common, it is impossible to differentiate by clinical non-bacteriological methods in the early stage. The most that can be said is, that in the mild cases of Malta fever the facial appearance is less distressed; the gastric disturbance and epigastric tenderness are more pronounced than in typhoid, and muscular pains are apt to predominate.

\*Notter says, though in the early stage diarrhoea is not the rule, it is often present and the stools, though generally dark are sometimes "loose and pale." He adds, "I have found tenderness and gurgling over the iliac region present in nearly every case \* \* \* \* \*" "The tongue is coated white with red edges \* \* \* \* \*"

I have no personal acquaintance with this disease except in the later stages among men who have been invalided home on account of, and still go on suffering from this very persistent fever.

In chapter 4 I have given a Malta fever temperature chart, which closely resembles typhoid. Such a regular rise is not the rule. It is, however, the cases which *do* resemble typhoid which concern us. In some cases the temperature is intermittent and sweating takes place with the fall, but it is only one type. Hughes says that continued fever characterizes many cases. "The \* \* \* \* \* typical wave of pyrexial intensity rises like the ideal curve of enteric fever \* \* \* \* \*" Bruce to the same effect: "The type varies from continued to intermittent: one case is almost continuous throughout, another almost intermittent \* \* \* \* \*"

Fortunately a new means of diagnosing Malta fever has been found. It will be referred to in a later chapter.

\*Quain's Dictionary of Medicine, 1894.

\*Malta Fever. Edinburgh Medical Journal, 1876.

## REPORT OF AN EPIDEMIC OF DIPHTHERIA ON BOARD THE UNITED STATES STEAMSHIP BUFFALO.

By GEORGE EDWIN HURST HARMON, M.D.,  
MEDICAL INSPECTOR IN THE UNITED STATES NAVY.

THE Buffalo, a large, roomy ship of 6888 tons, built for a passenger and freight steamer to run between New York and New Orleans, was completed in 1897 and was purchased by the Government at the beginning of the late Spanish war. She was employed in 1901-2 as a naval transport and made two voyages to the Asiatic Station, carrying to and fro stores for the fleet and large numbers of officers and men. She arrived at New York in October, 1902, with nearly one thousand persons on board.

Without being subjected to any thorough cleansing or disinfection, she proceeded to Norfolk Navy Yard October 22nd., and there received on board 450 landsmen for training, all new recruits, who, together with her regular crew, aggregated a total ship's company of about 750.

The landsmen were put on board at once upon her arrival, and the ship remained at the Navy Yard forty-four days undergoing repairs, the Navy Yard workmen on board with their usual attendant litter and dirt, the heating and ventilating systems not in use, and, during much of that time while in dry dock, the latrines, some distance away, proved to be deficient in capacity, and so defective that a special report was made by the Surgeon of the ship, and, as a temporary relief, a trench was dug for the accommodation of the large crew.

During the stay of the ship at the Norfolk yard, 38 cases of epidemic catarrh were treated.

For some months previous to their transfer to the Buffalo, these landsmen for training were quartered on board the receiving ships Franklin and Richmond, both of which vessels were

crowded with recruits. These points are thus dwelt upon as the most probable causes of the wide spread epidemic of diphtheria which shortly after broke out on board the Buffalo. A large number of young recruits, mostly from the western states, wholly unused to ship environment, and ignorant of the "nack" or knowledge of taking care of themselves which older seamen acquire, kept on board crowded receiving ships from one to three months and then transferred to the Buffalo under the untoward circumstances narrated above, doubtless brought with them a lowered physical vigor and loss of vital elasticity which lessened their normal resistance to disease, and imparted to individuals a receptivity to the contagium, a case of diphtheria being once introduced in their midst.

The first case of diphtheria has not been definitely traced, perhaps a light case and was not recognized. But there is little doubt that the disease was brought on board the Buffalo at Norfolk, as it has been on board the Franklin and Richmond since, and is now prevailing on board those receiving ships.

The Buffalo left Norfolk December 4th., arrived at Tompkinsville, New York harbor, December 7th., and sailed thence for the West Indies December 12th, 1902.

Five cases of sore throat developed before leaving Norfolk, and ten others before sailing from Tompkinsville. Other cases appeared, some of them with severe local and general symptoms, swelling of cervical lymphatics, etc.

On December 22nd. the ship sailed from Samana Bay for Kingston, Jamaica, and the same day two cases appeared which were malignant in character, with profound toxic symptoms. Upon the arrival of the ship at Kingston, December 25th., anti-diphtheria serum was obtained and administered to both these cases, but too late to avail as they both died, one on the 25th, and the other the following day.

The ship sailed at once for Pensacola, where she arrived December 30th.

Up to this time forty-two cases of tonsilitis and eight of diphtheria were admitted to sick list; doubtless nearly all the former were really diphtheria.



Forty-eight cases were transferred to the naval hospital at Pensacola, where bacteriological investigation established the true nature of the disease, and an adequate supply of serum was obtained. Here a disinfection of the ship was made, as thorough as practicable without vacating the vessel, by means of bichloride scrubbings, live steam conveyed from the boiler by hose pipes; and the sick bay, and its contents, with formaldehyde gas.

New cases of diphtheria continued to appear although fewer in number, and, the accommodations, at Pensacola proving inadequate, the ship was ordered to Port Royal, S. C., where she arrived January 17th., and was at first refused admission by the South Carolina state quarantine authorities, but subsequently allowed to proceed to the naval station. Happily, at this station a large brick building of two stories, 70 x 130 feet in size, had, not long before, been fitted up for the accommodation of Naval apprentices, including a well equipped kitchen and a large bathroom abundantly supplied with hot and cold showers.

January 22nd the Buffalo was vacated, the crew quartered in this building on shore, and a complete and pains-taking disinfection of the whole ship was carried out. Sulphur gas, live steam and bichloride moppings in the larger compartments, and formaldehyde gas in smaller spaces.

This was followed by repainting the inside of the ship from top to bottom, and fresh coats of shellac on gun and berth decks. This being completed by February 2nd, some 206 men of the crew proper were returned on board to relieve the over-crowded condition of building 20 where 400 landsmen were still left with a sufficient staff of officers and petty-officers to take care of them. These landsmen were thus very comfortably provided for, and they were every day kept as much as possible in the open air at drills and amusements. Disinfection of the floors and walls was kept up daily by means of live steam and bichloride moppings, and damp sawdust was employed to lay the dust before sweeping the floors. Strict and incessant inspection of the men was carried out, personal cleanliness was enforced, clothing frequently changed and washed, and every dry day was utilized to air and sun bedding.

January 28th, the hospital at Port Royal was filled to its utmost capacity, and, new cases still appearing, four or five a day, a small building originally constructed for a "brig" or prison, was utilized as a temporary lodging for convalescents, and eighteen were transferred thither from the hospital.

February 2nd, both hospital and "brig" were full of diphtheria patients.

Owing to delay in procuring other buildings for additional quarters for the sick, and necessary material to prepare them for this use some two weeks passed, during which time the overflow of sick were kept in No. 20 building, a canvas screen alone separating them from the well. This was an unfortunate and serious error, and doubtless prolonged the duration of the epidemic.

February 17th., building No. 17 was assigned for use as a temporary hospital, and as soon as practicable was fitted up with kitchen, wash-house, latrine, beds, tables, stoves etc., and thirty convalescent diphtheria patients moved in.

Building No. 18, an unfinished machine shop, was provided with a new floor and used as an overflow house in bad weather for the landsmen in No. 20. This was used later as an isolation building for cleaning up and disinfecting those found free from throat infection before returning them to the ship. Still another building, the shooting gallery, was also fitted up as a detention ward to which doubtful cases were sent to await diagnosis by bacteriological examination.

All the sick were thus finally wholly separated from the well, and as soon as this was accomplished the epidemic began to wane. Cases became fewer and fewer, one or two a day, one a day, and sometimes days passed without a new case, until the last one on March 6th., which, strange to say, was from the Buffalo, a landsman in the sick bay who had not been out of the ship since the disinfection. He was probably infected by some one of the medical staff who had been in building 20. He was promptly removed to the shooting gallery at the first appearance of sore throat, and the sick bay again disinfected. No further cases occurred.

At my request, Surgeon T. A. Berryhill, U. S. N., was

ordered here from Pensacola for bacteriological work, and he reported February 17th. A temporary laboratory had been prepared and working material supplied by the bureau, with arrangements for regular supply of culture tubes from the Naval Museum of Hygiene in Washington. The Koch incubator, with kerosene lamp, proved most satisfactory.

We were from this time enabled to verify the diagnosis in every case, and to eliminate a few cases of simple tonsillitis. The patients in the hospital were also "cultured," and diphtheria organisms found in nearly all.

February 28th. the bacteriological examination of the throats of all the well landsmen and petty officers was begun, with the object of returning to the ship all those who were found to be free from the Klebs-Loeffler bacterium. Squads of twenty to thirty were separated from the others, sent to building 18, specimens taken from their throats, and on the following day those who were free were subjected to careful disinfection, bodies, clothing and bedding, and sent on board ship. Those who carried germs of diphtheria in their throats were placed under vigorous local disinfection with Loeffler's Solution and 2 per cent. solution of formaline, and nasal douches of Dobell's solution. It was curious to remark the tenacity with which some of these cases held on after this treatment and repeated examinations at intervals of a few days. Indeed twelve of them persisted to the time of the sailing of the Buffalo, and were left behind as a measure of safety. A large proportion, indeed nearly all, of these obstinate cases were old subjects of post nasal catarrh. They developed no general symptoms of the disease, remaining apparently in perfect health while their throats contained abundantly the micro-organisms of diphtheria.

The tedious work of thus weeding out the whole of the four hundred landsmen and some fifty petty officers and others consumed over three weeks, but it was carried out rigidly, and not a single individual escaped investigation. That our theory was good seems to have been proved by the fact that not a single case has presented itself since the landsmen were returned to the ship.

The Buffalo was reported ready for sea, and sailed March 25th. for New York.

Twelve landsmen with bacteria in their throats and thirteen convalescents, a total of twenty-five, have been retained here for further treatment; all of whom, with one exception, are practically well.

I have purposely reserved for the latter part of my report the clinical points of this epidemic of diphtheria which deserve some mention.

In the beginning of the epidemic the disease was not positively recognized, the patients being admitted to sick list with tonsilitis. The type too appears to have been mild until some two or three weeks had passed and the ship had spent some time at sea with ports closed and ventilation less efficient. Then occurred the two fatal cases, with others in alarming number and with increased severity of type. Getting rid of the sick at Pensacola and disinfection of the ship, although incomplete, "scotched" the disease for a time, but it was too widespread, had gained too firm a foothold, and so continued to spread among the young members of the ship's company.

Bacteria of diphtheria were found in nearly all of the sick landed at Pensacola.

The new cases—eighty-seven in number—appearing after the ship left Pensacola and during her stay at Port Royal, were again milder in character and benign in their course, which I have no doubt was due to the serum treatment which was employed in every case.

Many of these cases set out with initial symptoms of some severity; ugly throats with lymph patches covering the tonsils and fauces and sometimes extending into the pharynx, together with swelling of cervical and submaxillary glands. In not a single case was there serious invasion or obstruction of the larynx, nor was there one in which the false membrane extended to the nose. Toxic hebetude and prostration were usually well marked during the first days, but most of the patients began to improve in two or three days, and went on to convalescence and recovery.

Twelve out of eighty-seven, or about 13 per cent., have had prolonged convalescence with faucial paralysis and general

"muscle ache," with slow recovery of strength ; while two have exhibited mild peripheral neuritis with some loss of power in muscles of both upper and lower extremities, accompanied by slight persistent albuminuria. Albumen was found in the urine of many patients in the acute stage, but was not considered more than the ordinary phenomenon of depurative renal strain common to many acute febrile diseases.

Five cases of middle ear suppuration followed recovery from diphtheria, every one having a history of enlarged tonsils and eustachian obstruction in childhood. In two of these the membrana tympani exhibited the scars and deformities of previous ruptures.

The sheet anchor in treatment has been the early administration of diphtheria antitoxin ; indeed in most cases nothing else has been required beyond antiseptic and emollient local treatment of the throat, proper feeding and tonics during convalescence. The serum has been used in upwards of eighty cases since the Buffalo arrived at Port Royal, in some cases repeatedly, without any visible ill effect or untoward accident. With care and attention to aseptic details not a single case of suppuration has followed the puncture of the hypodermic needle. In a few cases a circumscribed erythematous rash has appeared, fading away in a few days and leaving no trace.

In cases of moderate severity, as most of them were, a single dose of 2000 units was all that was given ; more serious cases received a second dose of same strength in eight or ten hours. Two cases were given a third 2000 units at about the same interval of time.

Prophylactic doses of 1000 units of antitoxin were administered to some of the hospital attendants who were in close contact with the sick ; none contracted the disease. But it is to be said that two or three of these hospital corps men who did not get the serum equally escaped the diphtheria.

The ship's band is composed of eighteen musicians, all of them Italians. Out of this number seven, or nearly 39 per cent, contracted diphtheria, and in the throats of four others, who did not come down with the disease, the micro-organism was discovered.

In seeking the cause of this excessive proportion of cases among the bandmen, it was strongly suspected that the mouth pieces of their musical instruments were the sources of direct infection. These men are in the habit of playing one another's brass and reed instruments almost indifferently, and one original case of diphtheria among them might thus readily have spread the infection among others.

Measures were at once taken to disinfect the band instruments daily, and the mouth pieces as often as used.

This epidemic exhibits one more point worthy of mention. There are perhaps few or none on record showing so large a number of cases among male patients at the period of early manhood, eighteen to twenty-four years, otherwise in robust health. It is, I believe, an accepted theory among the authorities that diphtheria is dangerous inversely as the age of the patient; also that the older the individual the less susceptible he is to the disease.

While these theories may be given due weight, may perhaps account for the mild type of diphtheria on board the Buffalo, and for the fact that the disease was not contracted by any person above the age of thirty years, yet the fact remains that 18 per cent. of this ship's company of 750 men suffered from a disease which ten years ago had a frightful mortality under similar epidemic conditions in crowded masses of men, with a record of two deaths out of 137 cases, and *not a single death after the antitoxin treatment was begun*. The evidence in favor of the serum is conclusive; and I think we may indulge in the gratifying belief that many lives have again been saved through its instrumentality.

For the disinfection of clothing and bedding on such a large scale means had to be extemporized. White clothing, hammocks and mattress covers were soaked for four hours in a solution of mercuric chloride—1-1500—and boiled half an hour in clean barrels by means of steam jets. Blankets were treated in the mercuric solution and afterwards well rinsed in clean cold water. Mattresses and woollen clothing, ditty-boxes, etc., were opened out and exposed to formaldehyde gas twelve to sixteen hours in

a specially constructed, tight compartment, of about 3000 cubic feet capacity, the gas being obtained fresh from wood alcohol by means of four No. 1 Kuhn's generators, which proved satisfactory.

A drying room for clothing, blankets, etc., was constructed in one end of the shooting gallery, amply furnished with steam pipes and supplied with steam from building 20 close at hand.

All these disinfection details, though tedious, were strictly carried out under the personal supervision of a medical officer ; and it is my pleasant duty to acknowledge the intelligent, cheerful and efficient aid and co-operation of the medical officers associated with me in this duty.

Surgeon L. W. Curtis of the Buffalo, alone on board until the ship arrived at Pensacola, displayed energy and skill in combating the epidemic under difficulties and in the disinfection of the ship.

Surgeon T. A. Berryhill at Pensacola, and later when ordered to Port Royal, at my request, took charge of the bacteriological work and most efficiently carried out this indispensable part of the plan.

Passed Assistant Surgeon C. D. Langhorne was ordered to Pensacola upon the arrival there of the Buffalo and returned in the ship to Port Royal ; and he afterwards zealously devoted the whole of his time to the sick in the hospital until his detachment from the station March 10th.

I would also commend for suitable recognition the Hospital Corps staff both on board the Buffalo and at this station, who under stress of prolonged extra duties, involving in some cases long confinement to the hospital under quarantine, behaved admirably and reflected credit upon this new corps of the Navy which is very gratifying.

## TYPHOID AND MALARIAL FEVERS AT CHICKAMAUGA IN 1898.

BY MAJOR EDWARD CHAMPE CARTER,  
SURGEON IN THE UNITED STATES ARMY.

### *Typhoid Fever.*

A CAREFUL, accurate and comprehensive report, prepared by men of exceptional ability and energy has already been made on these subjects, and nothing of any value is likely to be added to that report by anyone. It is not expected therefore that statements made, or facts mentioned, in the following paper will contribute greatly to the fund of scientific information, especially as the report of Majors Reed, Vaughan and Shakespeare has been placed in the hands of the medical profession in a neat and compact form. The question may be asked, and justly, why is any further paper on this subject necessary? And the answer, equally just perhaps, is, that it is not necessary. But the fact that the writer was on or near the spot from the beginning of the development of the fever to the termination of the local epidemic, renders it possible that he may have some information of slight interest to impart. In the last sentence fever was mentioned, and not fevers, for the rule was that the two fevers, typhoid and malarial, did not coexist, though the latter sometimes followed the former, especially after September 10th, 1898, about which time, or perhaps to be more accurate, about September 5th, 1898, mosquitoes of various kinds appeared in swarms at and near Crawfish Spring.

The first case of fever contracted at Chickamauga Park, which I saw, came under my observation in Washington in May, 1898. A young officer of the regular army had been sent North, with no definite diagnosis. He had had the usual indefinite symptoms that suggest typhoid fever to the physician, but make the patient and his relatives hope and believe the case is simply



malarial, and to be relieved with quinine. The Diazo test of the urine, at that time much used by general practitioners, and Widal's test gave positive results. Spots appeared on the abdomen and the case ran a rather severe, but uneventful course.

Early in June, or in May, 1898, a wealthy, charitable and patriotic woman purchased and presented to the Government a large hotel, situated at Crawford Springs, about four miles from Camp Thomas, and a few days later the Surgeon General directed the writer to equip it as a general hospital, and to prepare as soon as possible to receive the sick from Camp Thomas. It is needless to speak to this Association of the difficulties that existed at the beginning of the war with Spain, in the matter of supplies, transportation, trained assistance, etc. On June 7th, 1898, a case of typhoid fever was admitted; another on June 9th.; two on June 13th.; one on June 15th., and so on. A few cases were admitted nearly every day, until the beginning of the second week in July, when they came in in large numbers. About June 20th, heavy rains had set in and much storm water had run into the Chickamauga River and into certain springs, particularly Crawfish Spring, and as cases of typhoid fever had existed at Camp Thomas as early as May, 1898, and as the dejecta of the undisciplined men were scattered over the territory which drained into the water supplies already mentioned it is difficult to see how they could escape infection. About one hundred yards from Crawfish Spring, and at a somewhat higher level, there was a "sink hole" or depression, which communicated with an underground stream that supplied the spring. The idea had occurred to the inhabitants of the village of Chickamauga that this depression was a good place to throw offal, dejecta, etc. Moreover, about five hours after a violent shower the water of Crawfish Spring became so muddy as to be unpalatable, showing that there was some other communication between the surface of the earth and the source of water supply besides the sink hole above mentioned. In the circumstances it was held necessary to boil all water from Crawfish Spring used for drinking in the general hospital. A chemical analysis showed a rather hard, sparkling water. Two examinations made by different bacteriologists dem-

onstrated the presence of Colon Bacillus and of large numbers of Proteus Vulgaris; neither examination was completed. Typhoid Bacillus was not demonstrated, but in spite of the negative evidence, such as it was, the water was characterized, and rightly too, as "suspicious to dangerous." Now it is one thing to give an order that a certain water must not be drunk, and another to enforce that order, and when the men are untrained, healthy young fellows who have never been ill, never seen any illness, never realized the necessity of paying any attention to hygienic rules, and unaccustomed to obedience in any form, it was well nigh impossible at first to have such an order carried out. Again, boiled water is flat and tasteless, and the water of Crawfish Spring as it bubbled up was clear, sparkling, cool—about 54° F.—and delicious. It was not surprising therefore that the Commanding Officer of the general hospital found that the boiled drinking water supply though well iced, lasted wonderfully long, and that the four hundred gallons provided each morning for the use of the five hundred inmates of the hospital were not greatly diminished by nightfall.

Another source of infection was undoubtedly the flies. They were present in myriads, and though the windows and doors of the hospital were screened, and the food covered with wire gauze dish-covers, flies occasionally settled on the food. As a result of these two causes, contaminated water and contaminated food, and perhaps of others, a certain number of typhoid fever cases developed in the hospital. Out of fourteen physicians who were exposed for various periods three fell ill with typhoid fever. So far as I was able to find out these three men had tried to obey sanitary laws. Out of 42 trained nurses who were exposed to infection for periods varying from ten to ninety days, 11 developed typhoid fever. These women had protected their food from flies so far as they knew, but most of them had drunk unboiled water at times. The percentage of attendants (Hospital Corps) who contracted fever was rather smaller than that of the trained nurses. The type of fever was more nearly that described in Liebermeister's classical article than any I have witnessed elsewhere. It increased in severity, as well as in the number of cases,

from about June 15th, to August 30th, then gradually diminished in severity until November. It varied in its method of onset from the indefinite malaise of the so-called "continued malarial fever" to the appalling stroke that made the diagnosis hang between acute appendicitis or cerebral meningitis on one hand and the profound toxæmia of epidemic typhoid on the other. Many cases were diagnosed malarial fever, especially in June and July, but all the cases that came under my observation were cases of typhoid fever. Many developed no diarrhoea; some showed no rose colored spots; all had more or less grave abdominal symptoms and all or nearly all to which it was applied (96%) gave Widal reaction.

The hot wet weather, the quantity of cold water drunk, and the unaccustomed fare, produced a number of cases of diarrhoea, but I do not think typhoid fever had anything to do with causing most of these cases. In other words it is my conviction that a considerable number of cases of diarrhoea would have existed had there been no typhoid fever present. In ten cases of persistent diarrhoea a sojourn of a week at a cool place, Lookout Mountain, Sewanee and Asheville, entirely though temporarily, relieved the looseness of the bowels, but soon after the cases returned to Chickamauga the diarrhoea set in again. In another case diarrhoea persisted for ninety-eight days; the number of discharges varied from six to twelve in each twenty-four hours; Widal's test was applied to the patient's blood several times and always with negative results.

Four patients with typhoid fever reported they had suffered with a former attack of that disease. Three of these cases were light, and recovery was prompt and thorough. The fourth case left the hospital under care of friends and was lost sight of. No case of grave phlebitis occurred, and the patients who developed post typhoid mental symptoms, dullness, loss of self-control, melancholia, as a rule made good recoveries. Cases that manifested cerebral excitement of a violent character early in the disease, usually perished. Observation of the results of transportation of the sick inculcated this point, viz: Moving typhoid fever cases in the first week, or ten days perhaps, is comparatively free

from danger ; moving these cases in the second week or ten days, is fraught with grave danger. After the third week or third ten days the danger from transportation is generally not very great. The period of convalescence, after patients were able to travel or go home on furlough, was usually sixty days. Few if any cases were fit for duty before the expiration of the two months. Owing to the condition in which typhoid fever is likely to leave the heart-muscle, as well as certain other organs, great care should be exercised in returning soldiers to duty after the fever. Nothing is gained by having with the columns a considerable number of quasi-invalids, stout looking perhaps, but likely to drop out of ranks after an hour's exertion, and almost sure to give out when most needed, and strongly inclined to develop irritable, weak, or dilated hearts with permanent disability. Too much stress can hardly be laid on this point, for it is our duty as physicians to look out for the physical welfare of our patients, and it is our duty as medical officers of the services to safeguard the interests of our Government. And this we can best do by diminishing the number of those who shall need pensions or Governmental care for the rest of their lives.

In connection with the causes above mentioned as the probable ones of the epidemic, it should be stated that a certain, though limited, number of cases of typhoid fever prevailed in 1898 in the neighborhood of Crawfish Springs, not more however than we often find in rural districts. Several of the cases I saw in consultation had been diagnosed malarial fever, gastric fever, nervous fever, autumnal or fall fever, but generally the case was a simple, uncomplicated typhoid fever.

In this connection it should be stated that though a considerable number of men had been employed for some years in building roads, clearing away undergrowth, etc., in Chickamauga Park, prior to the great encampment of Volunteers there in 1898, no deaths from fever, either typhoid or malarial, among the laborers is reported. There was very little typhoid fever at Chickamauga while it was occupied by the regular troops prior to the arrival of the volunteers, and the regiments which remained at Camp Thomas after October 15th., 1898, were singularly free from that disease.

**Malarial Fever.**

It is much to be desired that a positive statement might be made as to the co-existence of typhoid and malarial fevers in the same patient. Unquestionably many cases sent to the general hospital as victims of malarial fever developed typhoid fever and had it *ab initio*. "Malarial fever, complicated with hemorrhage from the bowels," was a not infrequent remark under diagnosis. When these cases came to the post-mortem tables they showed the characteristic lesions of typhoid fever. A few cases gave a temperature chart that suggested either a tertian remittent or an ordinary tertian ingrafted on a continued fever with rising temperature. Widal's reaction was generally positive, but the plasmodium was not demonstrated, though it may have existed. As a rule these patients had received large doses of quinine for an uncertain period before the blood examination was made, and usually, after five or seven days the fever settled down into a regular course of typhoid fever; so that it is believed the statement is justified that few if any cases of malarial fever originated at Chickamauga during the summer of 1898. Nevertheless a few cases of genuine malarial fever, tertian and quotidian types, did exist in August, 1898, among the people living near the Park. In September and October a number, not great however, of convalescents from typhoid fever at the general hospital contracted malarial fever. As before stated hosts of mosquitoes appeared in the early part of September, and in spite of wire gauze and mosquito bars, patients, attendants, nurses and doctors were tormented by these pests. The malarial fever was not confined to the patients in the general hospital for others suffered also. The type was not very grave however, if the patients could take moderate doses of quinine. Most of these cases were markedly jaundiced, the jaundiced appearance remaining sometimes for weeks or months after the patient felt quite well. An epidemic of jaundice prevailed in October, and while no one was seriously ill with it fully one-third of the command manifested symptoms of the disorder. One of the trained nurses died with malarial fever. She had come to Chickamauga from Florida about ten days before her death. She had a marked chill about 1:00 a. m., accompanied with great depression, afterwards she rested well un-

til about 11:00 a. m., when she had another severe chill with low temperature, depression, collapse and death. Her skin was nearly the color of mahogany and her urine loaded with albumin. She was nauseated, vomiting blood more or less changed in appearance, and as yellow fever was suspected in various places in Mississippi and Georgia this case caused some apprehension. A microscopic examination of the blood showed the blood disks broken up.

#### **Treatment.**

Nothing has been said about treatment, but as the hospital was provided with all the necessities and most of the conveniences possible in a somewhat hastily arranged military hospital, the treatment was in the main liquid diet and bathing.

When refrigeration was indicated and bathing was impracticable, use was made of a method first demonstrated to me by Major Oscar LeSeur, of Detroit. A rectangle of bolsters, muslin, stuffed with cotton batting, about six inches in diameter, was placed about the patient, one bolster passing over the neck and projecting some distance beyond the shoulders; to each end of this bolster another was attached which lay parallel with the body from shoulders to feet. The lower ends of these long bolsters were joined by a short bolster parallel with the one passing over the patient's neck. Patient and bolsters were covered with a rubber blanket which was pressed down between the patient and the long side bolsters so as to leave a waterproof trough on each side of the patient. Then cracked ice was laid on the rubber blanket over the legs, thighs, abdomen, thorax and arms of the patient, a thermometer placed in his mouth and an ice cap on his head. It is a process of dry refrigeration easy and simple of application, and I hope some of you will give this method a trial. If you do I am sure both you and your patients will remember Major LeSeur's name with gratitude.

In certain cases large rectal enemata of cold water were used and sometimes doses of phenacetine and caffeine were given.

#### **Conclusions.**

The conclusions of the writer are, viz :

1. That the waters of Crawfish Spring and of the Chickamauga River were contaminated.

2. That the contamination was greatest probably in June and in the early part of July, 1898, due to storm water.

3. That flies contaminated the food. The flies were very numerous in the tents during the period of the rains.

4. That while typhoid fever generally exists near Chickamauga Park, it hardly arises to the dignity of an epidemic.

5. That many cases, diagnosed malarial fever at Camp Thomas and among the rural population near Chickamauga, were cases of typhoid fever with no malarial complication.

6. That malarial fever did exist to some extent at and near the general hospital at Crawfish Springs.

7. That malarial and typhoid fevers may co-exist in the same patient, but that this rarely occurs.

8. That a diarrhoea or flux existed, at the General Hospital at any rate, not connected with typhoid fever.

I cannot close this article without bearing witness to the courage, skill, patience, self-sacrifice and patriotism of the trained female nurses who served at the Leiter General Hospital. They were Angels of Mercy indeed, and deserved and received the gratitude of the volunteer soldiers from Maine to Arkansas and from Wisconsin to Mississippi.

#### THE SEAMAN PRIZE ON MILITARY HYGIENE.

THE Military Service Institution of the United States announces that the prize of one hundred dollars in gold, established by Major Louis L. Seaman will be awarded this year to the best essay upon, *Military Hygiene; How Best to Enforce its Study in Our Military and Naval Schools; and Promote its Intelligent Practice in Our Army*. Competition for the prize is open to all members of the Association of Military Surgeons of the United States, the conditions of the competition being practically the same as those for the Enno Sander competition. The essay must be submitted in triplicate to the Secretary of the Military Service Institution, Governor's Island, New York, N. Y., must be in his hands not later than the 1st of November, 1904, and must not contain more than 15,000 words exclusive of statistics. The subject is a live one and we trust that there will be a very active competition for the prize.

A NEW GALLOPING AMBULANCE KNOWN AS  
"THE RAPID TRANSIT AMBULANCE."

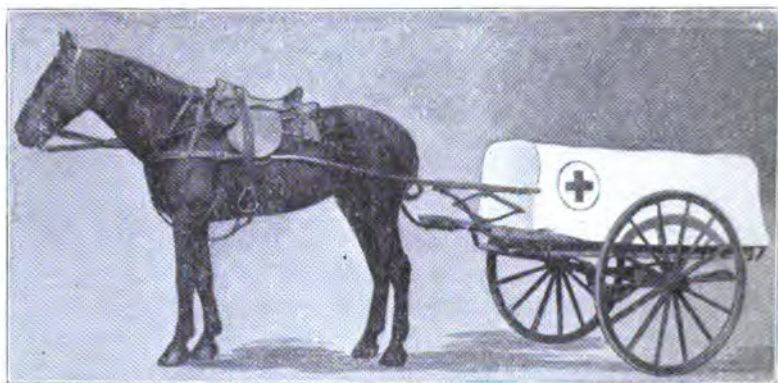
By LEONARD AVERY, M.R.C.S., L.R.C.P.,

LONDON, ENGLAND.

SURGEON-LIEUTENANT IN THE SUFFOLK IMPERIAL YEOMANRY.

THIS ambulance was designed with a view to filling the want of stretcher bearers with mounted troops.

The endeavour has been to construct a light strong carriage easily adjustable to any mounted horse and capable of keeping up with cavalry through any sort of country.



The Rapid Transit Ambulance Complete.

As will be seen from the accompanying engravings, the ambulance is a two-wheeled contrivance. The body consists of a platform fixed to a crank axle by long springs between 46 inch wheels. This platform is 2 feet and 3 inches from the ground, and is arranged to carry an ordinary service stretcher. The forepart consists of a pair of short shafts which are attached to the



body by an arrangement of springs adapted to prevent the side to side motion caused by the action of the horse. The shafts reach as far forward as the saddle flaps, where they are held in position by a girth strap, breastplate, and belly-band.

The body is covered by a canvas hood.

The weight is about 3 cwt. Length over all 12 feet. Track 4 feet and 1 inch.

Surgical dressings, splints, water bottle, etc., are carried.



**The Rapid Transit Ambulance.**

(Cover removed to show patient in place.)

It is quite easy for the driver, having placed a wounded or helpless man in a stretcher, to transfer him from the ground to the platform of the carriage single-handed.

This Ambulance has been on duty with the Suffolk, Sussex, Surrey and Middlesex Imperial Yeomanry during their respective trainings, and also with the Wiltshire Yeomanry through the recent manoeuvres.

It is a very comfortable conveyance and has proved itself capable of negotiating almost any country.

## THE VALUE OF STATISTICS IN CONNECTION WITH VENEREAL DISEASES IN THE ARMY AND NAVY.

By LIEUTENANT COLONEL VALERY HAVARD,

MEDICAL DEPARTMENT, UNITED STATES ARMY.

FOR our knowledge of the spread and prevalence of disease, statistics are necessary. They have great value if based on accurate statements and figures, and honestly interpreted. But we know how defective and incomplete they often are; how easily they lend themselves to any purpose, good or bad, to cover ignorance and prop error as well as to defend truth; therefore, how necessary it is to analyze them before they can be trusted and yield useful conclusions. This fallibility of statistics is particularly manifested in subjects of morbidity and mortality—and, of all diseases, those whose statistics are least trustworthy are certainly venereal diseases.

It may be interesting and instructive to compare, in this respect, the statistics of our army with those of our navy. We may assume that the surgeons of both services are equally able, experienced and efficient; that enlisted men, whether in army or navy, are of about the same standard of intelligence and morality; that they have the same abundant opportunities for contracting venereal infection; and, finally, that all men excused from any duty are made of record and go into statistics. Therefore, we would expect about the same proportion of venereal diseases in army and navy. Were we to consult general impressions (or perhaps prejudices) and the comparative statistics (such as they are) of other nations, we might be inclined to consider the navy the worse offender. But let us look at the figures:—

In the army, the rate of admissions for venereal diseases during the normal, peaceful decade 1889–1898 was 71.45 per 1000. After the Spanish War, the rate rose greatly and has been steadily increasing, being 127.35 for 1900, 155.39 for 1901 and

160.94 for 1902, with mean of 147.89 for the last three years. It may be remarked, incidentally, that these rates are higher than those reported by the army of any other country.

According to the reports of the surgeon general of the navy, the mean yearly rate for the navy and marine corps, for the period 1896-1902 is 51.6, ranging from 46 in 1897 to 57 in 1899, the mean for the last three years being 53.33. It should be noted that these reports give the total number of admissions in each disease, but not the ratio per hundred or thousand as in the army reports and all similar tables of morbidity; the above ratios, therefore, were computed by myself from the total strength of navy and marine corps as given in the reports.

Here then, confronting us, are the means for army and navy during the last three years:—the mean for the army being nearly three times greater than that for the navy; that is to say, for each 100 admissions in the army, there are but 36 in the navy. Whence this unexpected and astonishing difference? I confess my inability to give a satisfactory explanation of it. If it be due, wholly or in part, to better behavior, greater self-restraint or stricter discipline, then the sooner the army imitates the navy in all these practices and regulations which tend, so successfully, to preserve the men from sexual debauchery, the better for it. It is, however, necessary to consider the fact that the total ratio of admissions for diseases is much lower in the navy than in the army. Thus, in 1902, the ratio per 1000, for the entire U. S. Army, was 1514, and, for the navy and marine corps, only 640—much less than half. I presume it may be admitted that men on ships are, as a rule, in much better sanitary surroundings than men in camps and garrisons, being less exposed to draughts, changes of temperature and infectious diseases; drinking distilled water; inhaling sea air and taking salt baths. But whether such favorable conditions are enough to account for this enormous difference in the morbidity, is very doubtful. I cannot help believing that a certain proportion of minor cases are treated without being recorded, especially venereal cases which are clearly beyond the influence of the favorable conditions mentioned above.

But let us proceed in our comparison.

We have seen the difference in the ratio of admissions between the two services; now let us look into the comparative prevalence of the three venereal diseases: gonorrhea, chancroid and syphilis. Of course, gonorrhea is the most frequent in both army and navy, but not at all in the same proportion. Thus in the army, for the last three years, the number of cases of gonorrhea is more than double the total of all cases of syphilis and chancroids, while in the navy, during the same period, the number of cases of gonorrhea is *less* than the total of syphilis and chancroids.

But the discrepancy is much greater when we come to compare the cases of syphilis (primary and secondary) and chancroids. In the army, for the last 10 or more years, the number of cases of chancroids invariably greatly exceeds that of syphilis, the ratio for the last three years being 30.64 of chancroids to 18.49 of syphilis, the ratio for the last three years being 30.64 of chancroids to 18.49 of syphilis. In the navy, these figures are completely reversed, syphilis exceeding chancroids in the proportion of 539 to 238.

On this subject, statistics of foreign armies are somewhat confusing and bewildering, those of France and Germany sustaining the army, and those of England the navy ratios. But what say the authorities about the relative frequency of the two diseases? Fournier, has formulated the opinion now, I believe, accepted by most specialists, that, in private practice, chancre is more common than chancroid, but that, among the poor and dirty, and hospital patients, chancroids far outnumber (2 or 3 to 1) chancres. Where shall we place the enlisted man of the army and navy? Is he to be classed with the private patient who is personally clean and consorts with clean demi-monde prostitutes, or is he rather in the category of the average hospital patient, if not always as to himself, at least as to the sanitary condition of the harlots he has relations with? I am strongly inclined to the belief that, in this regard, army statistics are much nearer the truth than those of the navy. It may be venturesome to offer any explanatory opinion; the one that suggests itself is that, as already mentioned, many minor cases of all diseases in the navy

are not recorded; that chancroids are treated without being registered, while syphilitic cases are deemed more important.

My object, however, is not so much to express opinions as to elicit the views of others on this interesting topic of statistics, especially in their application to venereal diseases. Navy surgeons are the best judges of the value of their statistics, and the readers of the JOURNAL would doubtless be glad to hear from them regarding their methods of dealing with the sick and wounded, so far as records are concerned; to know what cases are admitted to the sick list and made of record, and to what extent men may be ill without being registered. Unless this information be furnished, navy statistics cannot be usefully compared with those of the army; or those of the army or navy of any other country, and therefore lose much of their value.

#### COMPLICATIONS AFTER GUNSHOT WOUNDS.

THE lesions that augment the development of tetanus and other infections in gunshot wounds appear to depend upon the sectional area of the bullet, its velocity, and the resistance encountered on its impact. (*Maj. L. A. LaGarde, —Trans. Amer. Med. Asso.*) The greater the sectional area or velocity of the bullet, the greater will be the lesion. Hæmatomas especially predispose to infection and increase the danger from tetanus, as is also the case when the wound is burned by powder, etc. Müller and Koller tried various methods of treatment of the channel track in gunshot wounds caused by projectiles that were primarily infected, namely: (1) controls, for which nothing was done; (2) those treated with a glass drain; (3) those treated with iodoform gauze drain; (4) those irrigated with 5 per cent. solution of carbolic acid; (5) those treated by rubbing with a cotton mop soaked in tincture of iodine; (6) those treated by cauterizing the wound. All the wounds were dressed with a clean sterile dressing, and the results showed that the animals treated by simple dressing did best of all, and that those treated by radical measures, such as swabbing with iodine and the application of the thermocautery, gave evidence of suppuration in every instance.—*Monthly Cyclopædia of Practical Medicine.*

## Reprints and Translations.

### REFUSE DISPOSAL IN CAMP.

BY MAJOR R. CALDWELL, F.R.C.S., D.P.H.,

ROYAL ARMY MEDICAL CORPS.

**T**HERE is little doubt, according to the experience of those acquainted with the general conditions of active service, that a large proportion of the diseases to which the soldier is peculiarly liable while engaged in the field result directly from the faulty disposal of the organic material which must of necessity collect about the habitations of man.

In virtue of certain vital agencies existing in the upper layers of the soil, Nature makes provision for the reduction of organic to inorganic material, the latter serving as food for vegetable forms of life, which, being in turn consumed by the animal creation and subsequently voided in the various excreta, complete the cycle of change on which the existence of all life depends. It follows from the above facts, which, of course, are sufficiently well known, that the natural destination for organic refuse is the earth, where harmful and offensive material is turned to purposes of essential utility in the scheme of Nature. Unfortunately, the agencies upon which the above process depends are limited in their powers, so that if space as regards soil is limited, or organic material excessive, there results a partially reduced mass of highly offensive matter, which forms an excellent breeding-ground for microbial life, certain harmless forms of which may, there is reason to believe, assume under these circumstances pathogenic powers of a sufficiently pronounced character. The practical application of these facts to the conditions of active service is fairly obvious. It is well known that in every camp the soil tends sooner or later to become polluted with all kinds of filth, and that in consequence certain diseases, notably enteric fever and dysentery, almost invariably make their

appearance; and the above sequence of events has been repeated too often, according to all experience, to leave any reasonable doubt as to the relationship in this connection of cause and effect. Latrine trenches and rubbish pits are often dug to a depth which must place their contents beyond the reach of those reducing agencies to which allusion has been made, and even if this is not the case, the concentrated nature of the refuse is a bar to its ready transformation into those simple chemical compounds which result when the process of reduction is carried out to its final completion. On the other hand, there is every reason to believe that liquefaction of the faecal or other organic matter takes place, with subsequent percolation through the soil and consequent danger of the most serious kind to neighboring water-supplies. As latrine trenches are multiplied, so the danger increases, and there is no doubt that standing camps are in many cases absolutely honeycombed with what may, for all purposes, be considered as nothing more or less than leaking cesspools.

It is a necessary consequence of the above that the question of refuse disposal is one of the main points which should occupy the attention of the sanitary officer in the field. It is, of course, at all times easier to indicate a fault than to suggest an appropriate remedy, and there is no possibility of laying down rules which can meet all the varying conditions of active service. There are, however, certain measures suggested by experience which seem to embrace a fairly wide field of applicability.

An example of such measures and of their results may not be out of place.

During the latter part of the South African Campaign, a camp formed for the purpose of a depot for neighbouring columns, and also as a place of security where convoys could outspan for the night, was established at Tyger Kloof, on the Harrismith and Bethlehem blockhouse line.

For reasons which are outside the scope of this paper, the camp covered a comparatively restricted area, and forming, as already stated, a halting-place for convoys, the refuse which had in consequence to be dealt with called for sanitary proceedings of an exceptional nature. Kaffir labour was fortunately obtainable and

not only was the filth produced by the mules and trek oxen regularly carted away, but all other refuse as well. Bucket latrines were substituted for trench latrines; and the excreta removed regularly at suitable intervals. Practically no organic refuse remained in the vicinity of the camp, all such being conveyed away about half a mile over the veldt and then destroyed as far as possible by fire, incombustible material being buried. I may state that after considerable personal experience of camps in South Africa, there were none of them of which I have any knowledge which, as far as sanitation is concerned, could in any way compare with that in question; and while other posts along the blockhouse line, where refuse was buried without removal, suffered severely from enteric fever and dysentery, the camp in Tyger Kloof maintained, comparatively speaking, an excellent standard of health. Although this was the only camp with which I was acquainted where such a thorough removal as the above of organic refuse was carried out, and although to generalize from an insufficient number of facts constitutes a logical fallacy, it is not unfair to assume that the measures in question were in all probability causally related with the satisfactory condition of the health of the troops:

It is interesting to learn in this connection that the question of the removal of refuse from camps has occupied the serious attention of American Medical Officers. On p. 208 of the Annual Report for the year ending June, 1899, of Surgeon General Sternberg, United States Army, to the Secretary of War, we read as follows: "During the movements of an active campaign, when a camp site is abandoned after an occupation of a few days, well-cared for privy pits afford a simple and satisfactory means of disposing of the excreta of the command. When, however, the camp is one of some permanency, as is usual with camps of organization, recuperation, muster, or territorial occupation, the danger from the use of this primitive system of conservancy is proportioned, other things being equal, to the size of the command and the duration of its continuance on the same ground. With cases of typhoid fever, dysentery, or camp diarrhoea among the troops, the pits become foci of infection which make their influence felt throughout the whole of the camp. . . . To preserve the health of the men in



these camps it is necessary to disinfect and remove the excreta." Later on in the Report Surgeon General Sternberg recommends the use for latrine purposes of "cylindric galvanized iron receptacles," which "should be removed at regular intervals and the contents emptied into a pit far from camp, or disposed of by cremation." Colonel Greenleaf, Medical Inspector of the United States Army, in a report dated San Francisco, California, July 31, 1899, speaks most favourably of the removal from camp of all excreta either in boxes or odorless excavating carts. "Kitchen garbage and camp refuse," he states, "are cremated or carted to distant points." In short, the principle of removal strongly favoured in the Report is, although differing in details, fundamentally identical with that which was followed with the most satisfactory results in the camp which I have mentioned.

In other camps of which I have had experience in the recent campaign removal of refuse was, owing generally to absence of the necessary labor, a matter of impossibility, with the results that enteric fever and dysentery sooner or later made their appearance. It is perfectly true that Tyger Kloof was not free from these diseases, but it was singularly free in comparison to other localities in the same neighbourhood, and this in spite of the fact that the camp was restricted in area, and the conditions tending to soil pollution were excessive.

Whether the colon or other bacilli can undergo transformation into the *Bacillus typhosus* is a matter concerning which, from my own knowledge, I am not in a position to make any assertion.

Two points, however, are worthy of attention: Firstly, that according to the observations of Roux the colon bacillus when grown in sewage is capable of imparting a disease clinically indistinguishable from enteric fever; and, secondly, that the portion of latrine contents which percolates into the soil becomes converted into basic nitrates, and being, as a rule, too far from the surface to be taken up as food by plants, it forms an excellent medium for the growth of any typhoid bacilli which may be present. It follows from the above that a latrine trench is an unsuitable destination as regards the disposal of enteric excreta, at any rate until the latter are rendered innocuous by sterilization.\* According to

recent researches by Firth and Horrocks, the enteric bacillus can survive for seventy-four days in moist soil (*British Medical Journal*, September 27, 1902). This fact strongly indicates the danger of burying enteric stools until they have been sterilized. Boiling according to the means designed by Major Cummins, R.A.M.C., would answer well for this purpose. Burning typhoid excreta, or, indeed, other forms of refuse containing large quantities of water, is not always satisfactory unless effected in a specially designed apparatus. If it is done in the open air an intolerable nuisance is created; the process is rarely carried out to its completion, and in consequence remnants of unconsumed filth are blown about the camp. Camp incinerators, of which there are several designs, appear from written descriptions to yield excellent results; but such appliances are not always available, and in these cases an improvised refuse destructor, which I designed at Aldershot, may be found fairly satisfactory. It consists of two trenches, about the depth and diameter of those of a camp kitchen, bisecting each other at right angles, with a chimney, constructed of sod, built over the angles of intersection. A fire is lighted at the foot of the chimney, and down the top of the latter the rubbish is thrown in small quantities at a time. The addition of a small amount of turpentine is a great help. A good draught is established, and, within reasonable limits, the higher the chimney, for this purpose, the better. It is true that I have not tried what the effect of this method would be in the field, but it is certainly a great improvement on burning the refuse in the open, and might be resorted to when specially designed and elaborate methods are not feasible. The procedures which, in view of the above, seem to suggest themselves as likely to be efficient in connection with the safe and satisfactory disposal of refuse are as follows:

In the case of a camp which is in temporary occupation only, shallow latrines within a foot or less of the surface will meet all the requirements of the case. The excreta in the trenches will be brought under the immediate influence of those reducing organisms which are found close beneath the surface of the soil, and after transformation into simple chemical compounds will be utilized as food by any vegetation which may be present. Shallow earth burial may also be resorted to as regards kitchen refuse.

In camps of more permanent occupation the above method can scarcely be suitable, unless a practically unlimited area of land is available. As a rule, removal, and removal only, wherever it is possible, will be the only method likely to prove satisfactory. The ordinary latrine bucket will be found to answer all purposes as regards excreta. Water or carbolic lotion may well be substituted for dry earth. Soldiers are proverbially careless as regards sanitation, many of them neglecting entirely to use the earth provided in the latrines. With the use of liquid in the buckets this difficulty disappears. A certain amount of dust also results from the use of dry earth, and flies are constantly to be found crawling over the contents of the buckets, even when earth has been carefully used.

On the whole, the other method suggested—*i.e.*, the use of liquid—would appear to give the best results. Removal should be followed by burial, except in the case of enteric excreta, which requires special treatment. Other refuse, besides excreta, should be removed and burned, or buried after removal if burning is not possible.

In the Afghan War carcasses of dead transport animals were soaked with kerosene and burned. This method was well spoken of, but I have no experience of it myself.

The danger to health accruing from the presence of decomposing organic matter need not be insisted on here; its removal from the immediate precincts of any form of habitation is evidently a matter of prime necessity, and the sanitary history of the camp at Tyger Kloof affords a useful object-lesson of the results which flow from a rigid regard to what, after all, is one of the most elementary rules of common-sense, sanitation.

NOTE.—At Kilworth musketry camp, of which I was in charge in the late summer and early autumn of 1899, an exceptionally high standard of health prevailed, in spite of the fact that the ground had been in prolonged occupation. All refuse was, however, carefully removed.—*Journal of State Medicine.*

# Medico-Military Index.

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**JOHN COCHRAN,**  
**DIRECTOR GENERAL OF THE MILITARY HOSPITALS**  
**OF THE CONTINENTAL ARMY—1781-1783.**

## Editorial Department.

### • The Surgeon Generals of the United States Army

#### IV. JOHN COCHRAN, DIRECTOR GENERAL OF THE MILITARY HOSPITALS OF THE CONTINENTAL ARMY, 1781-1783.

UPON the resignation of Director General Shippen the duties of the office, devolved by action of Congress upon the next in rank, Dr. John Cochran, who was born, September 1st, 1730, in Chester County, Pennsylvania, of the Scotch-Irish stock which has proven so strong in that locality. Early manifesting studious tendencies, he was given the best school advantages of the vicinity and finally placed with Dr. Thompson of Lancaster for the pursuit of the study of medicine.

When he had completed his medical studies, in 1755, the French and Indian War of that time broke out. Attracted by the opportunities for clinical observation afforded by the military hospitals he entered the British service as surgeon's mate, and served with high credit throughout the war, acquiring the practical skill and experience which he realized was so essential to the best professional work.

At the close of the war, after a short residence in Albany where he sought and obtained the hand of Miss Gertrude Schuyler, the only sister of General Philip Schuyler, he established himself in New Brunswick, N. J., where he continued to win the high opinion of the community.

Upon the outbreak of the War for Independence he espoused the American cause with devoted loyalty and toward the end of 1776 tendered his services as a volunteer without pay in the hospital department. He came under the personal observation of the Commander-in-Chief who evinced the highest appreciation of

his ability and, upon learning of the reorganization of the hospital department in 1777, wrote to Congress that "I would take the liberty of mentioning a gentleman whom I think highly deserving of notice, not only on account of his abilities, but for the very great assistance which he has afforded us in the course of this winter, merely in the nature of a volunteer. This gentleman is Dr. John Cochran, well known to all the faculty and particularly to Dr. Shippen who I suppose has numbered him among the candidates. The place for which he is well fitted, and which would be most agreeable to him, is Surgeon General of the Middle Department ; in this line he served all the last war in the British service, and has distinguished himself this winter particularly in his attention to the smallpox patients and the wounded."

In accordance with the recommendation of General Washington, Dr. Cochran was on the 10th of April, 1777, duly appointed Physician and Surgeon General of the Army in the Middle Department, being retained in the service also at the reorganization of 1780 with the grade of Chief Physician and Surgeon of the Army. In these capacities his conduct was uniformly characterized by credit to himself and benefit to the service so that when the office of Director General was vacated by the resignation of Dr. Shippen in 1781, he was promptly elected to the position which he retained until the disbandment of the Army.

During this period the medical department gradually eliminated its less desirable features and steadily progressed in the matter of adaptability to service conditions. Legislation from time to time assisted in this process. The "Medical Committee" of Congress which had hitherto had control of the medical department of the army,—sometimes to its disadvantage but on the whole to its advantage,—was supplanted in its functions by a "Board of War," which continued the intimate supervision of medical matters. Promotion by seniority in the medical corps was provided and the offices of chief physician and surgeon of the army and chief hospital physician were abolished. Inspection of the medical department by officers of the Inspector General's Department was instituted in 1782 and regulations for the medical purveying department were established.



The relative rank of medical officers was fixed by a resolution providing that medical officers who served to the close of the war should be entitled like other officers to half pay for life,—the Director the half pay of a Lieutenant Colonel and all other officers except mates the half pay of a Captain. The actual pay of medical officers was also gradually evolved until in January, 1783 the monthly pay was fixed as follows:

Rank	Pay	Subsistence	Total
Director.....	\$102.00	\$60.00	\$162.00
Deputy Director	100 00	48.00	148.00
Surgeons.....	90.00	40.00	130.00
Mates.....	42.00	12.00	54.00

In 1783, Dr. Cochran was mustered out of the service and removed to New York, where he resumed the general practice of medicine. Soon after the inauguration of his former Commander-in-Chief as President, General Washington, having in the President's own phraseology, "a cheerful recollection of his past services," appointed Dr. Cochran Commissioner of Loans for the State of New York, an office which he held until disabled by a paralytic stroke which precluded further service. He then resigned and withdrew to Palatine, N. Y., where he passed away on the 6th of April, 1807.

He was a man of strong will and clear mind tempered and directed by a rare tact and respect for the rights and opinions of others, which led him safely through pitfalls and obstructions which made sad work of the careers of others less favored by nature and opportunity. Thacher, the pioneer American medical historian, rated him most highly, remarking that, "he united a vigorous mind and correct judgment with information derived and improved from long experience and faithful habits of attention to the duties of his profession. He possessed the pure and inflexible principles of patriotism and his integrity was unimpeachable. It is gratifying to have this opportunity to express a respectful recollection of his urbanity and civilities, and of affording this small tribute to his cherished memory".

## THE EMPRESS MARIE FÉODOROVNA INTERNATIONAL RED CROSS PRIZE FOR 1907.

**A** NNOUNCEMENT was made at the Seventh International Conference of Red Cross Societies held at St. Petersburg in May, 1902, of the foundation, by the Dowager Empress Marie Féodorovna of Russia, of a fund for the purpose of encouraging inventors and others to devise improvements in the means of dealing with the ill and injured in the field. The sum set apart for this purpose amounts to 100,000 roubles,—about \$55,000—the interest of which is to be expended every fifth year in prizes to be awarded at each succeeding International Red Cross Conference.

The competition is open to the world and competitors will be required to place their inventions on exhibition at the quinquennial exhibition of ambulance material to be held every five years in connection with the International Conference of Red Cross Societies.

The prizes at the first competition which will occur in 1907 will be three in number and will be awarded to competitors who submit in whole or in part the best solutions of the problems connected with rendering aid to the wounded, whether on land or sea and in the following directions :

1. The surest and quickest means of searching for and removing the wounded from the field of battle.
2. The best type of litters or vehicles for moving the wounded to the dressing stations with the greatest rapidity and with the least degree of suffering.
3. The means of saving lives at sea.
4. The best installations in movable hospitals, wagons, ships, etc., for the final evacuation of ill and injured.

The scope of this competition is so broad and its provisions so generous as to render it most attractive. America has become marked for the abundance of inventive genius among her people and it is to be hoped that one or more of the prizes so generously offered for this contest may come to the United States.

## Reviews of Books.

### AMERICA IN THE CHINA RELIEF EXPEDITION.\*

**I**T is very fortunate that the historical account of the China Relief Expedition has been taken up by the distinguished officer to whom we owe this valuable work and who was himself so conspicuous a figure in the expedition as well as so able and explicit a historian. The account of the expedition begins with a brief statement of the early history of the causes which led up to the Boxer uprising and continues in detail throughout the course of the entire work. Chapter XXVI is devoted entirely to the medical department and gives a very brief account of its work. It is to be regretted however, that the author felt inclined to indulge in such indefinite statements as "medical men have their failings as all of us have, and the Department in the earlier days of the war showed some grave defects," for while doubtless the statement in question does not refer to anything particularly serious yet its very indefiniteness gives room for serious misapprehension. General Daggett comments upon the fact that the medical department was obliged to rely upon another Staff Corps for its transportation and to the embarrassment which arose from that fact—a point which is well worth emphasizing. In connection with General Daggett's book it will be of value for Major Ives' article in the last volume of this JOURNAL to be read, as supplementing from the medical standpoint the statements of General Daggett from the military point of view. The work closes with twenty-five appendixes comprising the most important official documents relating to the expedition and well rounding out a most valuable contribution to military and international history.

**\*America in the China Relief Expedition.** By Brigadier General A. S. DAGGETT, U.S.A., Retired; 8vo; pp. 267 with numerous illustrations and maps; Kansas City, Hudson-Kimberly Publishing Co., 1903.

## MODERN SURGERY.\*

SOME years ago the writer had the pleasure of reviewing the first edition of this book. The high opinion that he expressed of it at that time has been in no wise modified in the editions which have appeared since that date. During the decade which has elapsed since its first appearance, the book has grown to nearly three times its original size, but even with these additions it is still easily within the limit of convenient handling and easy reference. Dr. DaCosta has a rare facility of expression which renders his text singularly clear and attractive. The third edition was an entirely worthy development of the treatise but the fourth edition is a still further improvement upon its predecessor, the large and extensive additions necessitated by the progress of surgery being compressed within a reasonable bulk by the adoption of a larger type page.

## THE PENSION EXAMINING SURGEONS.†

THE first volume of Transactions of the National Association of United States Pension Examining Surgeons, embodying a report of the second meeting held in Washington last Spring, together with an account of their first meeting at Saratoga Springs in 1902, is naturally of much interest to military surgeons, all of whom are accustomed to act from time to time as pension examiners. The literary features of this handsome volume all have a well-marked application to military medicine and comprise nine papers respectively upon: "Defects in, and Suggestions for the Improvement of the Reports of Examining Surgeons," by Dr. J. F. Raub; "Rheumatoid Affections Considered as Pensionable Disabilities," by Dr. P. Y. Eisenberg; "Chronic Malaria with Reference to Digestive Complications," by Dr. John C. Hemmeter; "Physical Signs of the Heart," by

\**Modern Surgery*. General and Operative; Fourth Edition. By JOHN CHALMERS DACOSTA, M.D.; 8vo: 1099 pages, with over 700 illustrations, some in colors. Philadelphia, New York, London; W. B. Saunders & Company, 1903.

†*Transactions of the National Association of United States Pension Examining Surgeons*. Vol. 1; 8vo; pp. 215; Rochester, N. Y., 1903.

Dr. C. W. S. Frost ; "Diseases of the Respiratory Tract," by Dr. William Warren Potter ; "Tropical Abscess of the Liver," by Dr. Ernest F. Robinson ; "The Etiology of some Pensioned Disabilities, Measured by Modern Pathology," by Dr. W. T. Sarles ; "Eye and Ear Examinations" by Dr. Joseph O. Stillson ; "Insanity as a Sequel to Physical Conditions," by the late Dr. A. B. Richardson. These papers were all well and fully discussed, and, taken together form a most valuable contribution to military medicine.

THE FIRST AID TEXT BOOK OF THE AMERICAN  
NATIONAL RED CROSS.\*

**D**URING the present year the American National Red Cross has organized a first aid department and is now actively engaged in the propaganda of the subject. The present work is the outcome of a demand for a text book for these classes and embodies some novel features not hitherto present in such works. The most conspicuous of these is the presentation of anatomy and physiology and of first aid on alternate pages. The subject of first aid is stated in clearly defined outlines and excellently put. The subject of anatomy and physiology is most effectively stated while the two combine to form a very useful remembrancer of the subject for the use of the primary first aid student. Upon each alternate page also a space is left for pencil notes by the members of the classes. An interesting feature to the more advanced student interested in the literature of the subject is a first aid bibliography appended to the text book proper. It would seem to the writer however that this might well have been omitted from a book of this kind for non-professional classes and that a list of perhaps two or three of the works best adapted to further study could with advantage in a future edition be substituted for it. This however is hardly a "spot upon the sun" for the book is a most valuable contribution to the subject of first aid instruction.

**\*Text Book for First Aid Classes of the American National Red Cross.** Arranged by EDWARD HOWE, Superintendent of the First Aid Department; with Notes on Anatomy, Physiology and Hygiene by Major HENRY PELOUZE DE FOREST, N.G.N.Y.; 12mo.; pp. 102; New York, American National Red Cross, 1903.

## THE PRACTICAL MEDICINE SERIES OF YEAR BOOKS.\*

THE tenth volume of the 1903 series of Practical Medicine Year Books covers the subject of Skin and Venereal Diseases under the editorship of Professor William L. Baum, and Nervous and Mental Diseases under the editorship of Professor Hugh T. Patrick with the collaboration of Professor Charles L. Mix. The series is designed primarily for the general practitioner and embodies an excellent resumé of the latest literature upon the subjects considered.

## HANDBOOK FOR NONCOMMISSIONED OFFICERS OF INFANTRY.†

THIS little book is a useful and simple guide to the duties of infantry noncommissioned officers which should render the work of instructing them much less laborious for those officers who avail themselves of its advantages. It would be worth while for each company to be provided with a dozen of these little books for the information of these most important elements of its personnel.

## PROSTATE GLAND AND ADNEXA.‡

THE author gives us a very interesting monograph upon the subject of the non-surgical treatment of diseases of these important organs. The work is interestingly and intelligently written, well illustrated and of distinct value to the practitioner.

\**The Practical Medicine Series of Year Books.* Under the general editorial charge of GUSTAVUS P. HEAD, M.D., Volume X., Skin and Venereal Diseases—Nervous and Mental Diseases. Edited by W. L. BAUM, M.D., HUGH T. PATRICK, M.D.; September, 1903; 12mo; pp. 236; Chicago, The Year Book Publishers, 1903.

†*Handbook for Noncommissioned Officers of Infantry.* By Captain M. B. STEWART. 16mo.; pp. 102; Kansas City, Hudson-Kimberly Publishing Co., 1903.

‡*A Non-Surgical Treatise on Diseases of the Prostate Gland and Adnexa.* By GEORGE WHITFIELD OVERALL, A.B., M.D.; 12mo.; pp. 207; Chicago, Rowe Publishing Co., 1903.

## ON THE PREVENTION OF THE SPREAD OF INFECTIOUS DISEASES ON BOARD SHIP.\* †

By HENRY GUSTAV BEYER, M.D.,

SURGEON IN THE UNITED STATES NAVY.

THREE times within a twelvemonth the U. S. Training Ship Prairie was threatened with an invasion of Measles.

This disease, as is well known, is considered very contagious and most of the Prairie's seven hundred men, at that time, were still of a susceptible age, namely, between eighteen and twenty years. Isolation, under the prevailing but perfectly normal conditions of overcrowding on board every warship in commission, can at best be partial and incomplete, if possible at all. The free communication that exists between the different decks and the different compartments of the same deck, the large number of daily drills, all tend to spread and disseminate any disease germs that may get among the crew, as thoroughly as if done in a churn. It can, therefore, easily be conceived that such an epidemic, either of measles, mumps, diphtheria, or any other contagious disease, under circumstances so favorable for their development and spread, would mean the temporary conversion of a training ship for landsmen into a hospital ship for contagious fevers, to the great loss in time and expense for the government.

\*The title of this paper sounds somewhat too pretentious, since what I have to say has especial reference to measles alone and applies to allied infections only in a general way.

†At present, the distribution of infectious diseases among the different ships and naval stations is about as follows:

1. At Puget Sound; Small Pox.
2. San Francisco; Diphtheria.
3. Boston; Diphtheria and Scarlet Fever.
4. New York (Minneapolis): Cerebro Spinal Meningitis.
5. Newport; Measles, Mumps and Diphtheria.
6. Norfolk (Franklin and Richmond); Diphtheria.
7. Port Royal; Diphtheria.
8. Pensacola; Diphtheria.

Besides these there was Diphtheria on the Buffalo, and about two months ago Small Pox on the Alliance.

It is, therefore, also reasonable to assume that any help we might be able to derive from recent experience which would seem to aid us in intercepting the onset, limiting the spread or impeding the progress of a disease of this character, even in the slightest degree, and under similar circumstances and conditions, would prove more or less useful and welcome.

It is perhaps safe to say, even without referring to more accurate statistics on the subject, that measles, influenza, mumps, diphtheria and typhoid fever are the most frequent among the infectious diseases with which our ships are menaced, at least while cruising in home waters. Some or all of these have, within recent years, at any rate, arrived on board the various receiving ships with the recruits sent there from all parts of the country by recruiting parties. Here, finding the conditions most favorable, they thrive and spread like bacteria in an incubator, on a most favored medium and at the temperature optimum, long before even their existence is in the least suspected and thus the foundation for a long and wide-spread epidemic is laid as a consequence when the first case is discovered. All the receiving ships are at present overcrowded far beyond their allowable capacity and insanitary generally for many other reasons in addition. The number of medical officers on board, up to the present time, was wholly inadequate and the means at their disposal for combatting such wholesale invasions wholly insufficient. Hence their efforts were practically restricted to the sending of their patients to the hospital as they developed and which meant, to a stage in the development of the epidemic when preventive measures were all but useless. The disease-germs were either abroad, distributed throughout the entire ship or found more carefully packed away in bags and hammocks, ready to be transported to other ships whenever the time came for a draft of men to be shipped. It need, therefore, surprise no one that these receiving ships are looked upon today as the great centers of distribution of the infection to the cruising ships and the first in line to receive it are the training ships.

In this manner whole fleets have within recent years been known to be invaded and measles and mumps, more especially, have dragged along for months in a semi-epidemic form aboard



all its different vessels. The large number of cases that have, from time to time, been recorded as having occurred on board our great Pacific transport ships, where the cases that developed between the time of their departure from San Francisco and that of their arrival in the Philippines or China, have been counted by the hundreds, is also a well known matter of record. The most radical means, of course, would be specific vaccines for the several diseases we know to be infectious; for, although we might sterilize the clothing and the person of the recruit before taking him on board and allowing him to mingle with the crew, he might still harbor the germs within him and the disease be in the stage of incubation. But, while every physician must gratefully acknowledge the undeniable fact that preventive medicine has been fundamentally advanced by the gradual but sure development of bacteriology, our early—but unwarranted and too sanguine—expectations and hopes, aroused by the earlier discoveries, combined with a too vivid imagination, of soon arriving at general conclusions and formulating general rules for treatment, by means of the simple application of which all sorts of infectious diseases would be easily prevented or cured, were very soon doomed to disappointment.\* As time went along, a closer acquaintance with and a more thorough study of bacteria soon resulted in showing that their chemical and physiological characters differed so widely among themselves that generalizations upon a limited number of facts only became dangerous pitfalls. Their manner of invading the animal organisms, their mode of spreading from one individual to another, the degree of virulence and of susceptibility, were found to vary with each infectious agent and with each individual case. This necessitated a detailed and independent study of each and every pathogenic germ and strictly required that the conclusions drawn from such a study be limited to the particular germ or case of infection under investigation.

So far, the artificial immunization of man against an infectious disease that has proved practicable and of general applicability, we only have in the case of variola and this great achievement has had but a remote connection with modern bacteriology, The short duration of the artificial immunity produced by the

diphtheritic antitoxin makes the general application of it, as a vaccine, during the intervals of an epidemic, an impossibility; while the immunization against plague, cholera and typhoid fever must still be regarded as being in the experimental stage and even its future would seem as not sufficiently assured.

In the meantime, we are obliged to do the best we can and to resort to other means in our efforts at preventing the spread of infectious diseases but these means must nevertheless be in full agreement with the laws laid down by experimental bacteriology. We must ever take into account the biological characters of the infectious agent involved, whether the agent concerned has ever been seen or not. There is, at present, hardly any pathogenic germ that can be called unknown, although some may have remained unseen and undiscovered. An excellent illustration of this we have in the group of diseases to which measles belongs.

Measles, together with scarlatina, variola, varioloid, varicella, rubeola and febris exanthematicus, form a distinct group of infectious fevers, having some very essential characters in common. All the diseases of this group are characterized by a peculiar skin eruption; they are all distinctly contagious and leave usually an enduring immunity. The germs causing these diseases have never been seen but they can hardly be said to be entirely unknown for we know that they cannot belong to the class of bacteria. It is highly probable that they find their way into the human organism through the mouth, throat and nose; it is certainly known that they cannot thrive outside the living body, although they do remain virulent for a time outside their natural host. Hence it results that the chief danger from infection in all this group of diseases, lies first and foremost with the patient himself and only in the second place with persons and things with which he has been brought into immediate contact. These facts have an important bearing upon preventive measures.

The above mentioned three invasions of measles occurred in the following order, viz.: (1) On December 30, 1901, after the *Prairie* had left Hampton Roads, Va., for the Gulf of Paria with a draft of 350 landsmen for training, transferred to her from the Receiving Ship *Franklin*, on the preceding day, the first case of

measles was discovered and, on January 3, 1902, the second case was admitted to the list. Between January 13 and 17, nine more cases were admitted; then between the 25th and 30th of the same month four more cases were admitted. After this, no more cases occurred and the first invasion was, therefore, at an end.

(2) Between September 27, and October 12, two cases of measles occurred, one of which came to us from the Receiving Ship Wabash, the other from the Receiving Ship Minneapolis, on board of which latter the disease was especially prevalent. These two last cases, being promptly and with due precautions sent to the nearest naval hospital, the disease did not spread. (3) On November 7, 1902, two days after the Prairie had left Norfolk, Va. with 500 marines bound for Culebra, one case of measles was discovered among those of the marines who came on board at Norfolk. This one case was the cause of three more cases, admitted just fourteen days later, namely, on the 21st of November. No more cases followed and, thus, the third invasion had come to an end.

The first epidemic ran its course in the Gulf of Paria, the second in home ports and the third in Great Harbor, Culebra Island, Porto Rico. Of the thirteen cases of the first epidemic, eleven certainly contracted the disease from the cases brought on board or those that followed them. From the two cases of the second the disease did not spread at all. From the four cases making up the third epidemic, three contracted the disease on board.

The average period that elapsed between the time of admission of the several groups during both the first and third epidemics, was almost exactly fourteen days. The average number of days of treatment, that is, the number of days on the sick list, of the eighteen cases that showed no complications, was 8.58 days. Of the three remaining cases two were sent to the hospital and one had glandular abscesses. The last three cases were not included in making up the average.

*Treatment.*—Before giving the treatment that was employed, a few words must be said with regard to the diagnosis of the disease. Since measles patients, as is well known, begin to spread

the contagion from three to five days before the characteristic eruption appears, an early diagnosis, very naturally, becomes a subject of fundamental importance, in fact, is the beginning of all successful preventive treatment. This is more particularly true and applies with especial emphasis to ships in which overcrowding is the normal condition.

There are several points in the symptomatology of measles that may be considered helpful in the making of an early diagnosis, although none of them can, by itself, be regarded as absolutely entitled to be relied upon in establishing it beyond doubt. The period of incubation occupies ten days up to the initial rise in temperature, fourteen days up to the time when the eruption appears on the skin. Toward the end of the second day after the initial rise in temperature, there usually appears the characteristic eruption on the hard and soft palates. Some time before this, Koplik's spots may have made their appearance. These consist in certain small white points, surrounded by a red areola, on the mucous membrane of the cheek and situated opposite the molars; they are probably the result of pressure from the teeth against a mucous surface in which the vaso-motor tone has been lowered by the measles poison. About this period the general symptoms of a cold are well pronounced; there may be an irritable cough, a conjunctivitis, or a blepharitis with a slight oedema of the lids; the diazo-reaction may or may not be present. If it is, it is a sign of the greatest value, because it is present in no other disease of this group. The temperature curve is rather characteristic. After the initial rise, there usually occurs a fall almost down to the normal, then a gradual and daily increasing rise, until, on the fourth day after the initial rise, the curve reaches the same height and the peculiar skin eruption appears, when, of course, all doubts, as regards diagnosis, are at an end.

During the several epidemics occurring on the Prairie, the rule was established to subject every man reporting himself with a common cold to a very minute examination and, on the slightest suspicion being aroused, to isolate him and all his belongings from those of the rest of the ship's company. Very few of those thus isolated, did not develop the eruption, while the great ma-

jority of cases was diagnosed on the second day after the initial rise in temperature and two days before the skin eruption appeared. It was interesting to note how quickly the hospital steward and the apprentices learned to recognize the early characteristic symptoms of the disease.

The disease once diagnosed, the patient was treated as follows: A clean white sheet was spread upon the deck in the sick bay and upon this the patient stepped and left all his clothes, including shoes. All the clothes, excepting the shoes, were wrapped up in the sheet and put aside for steam sterilization, the shoes being separately disinfected with solution of bichloride of mercury. The patient received, first, a thorough scrubbing with warm water, soap and a sterilized brush: going over every square inch of his surface, after which he was sponged over with a solution of bichloride (1:2,000), enveloped in a clean sheet moistened with the same solution, put to bed and covered with blankets. The bichloride bath was repeated three times daily during the time the eruption was at its height, twice daily the rest of the time. His mouth and nose were cleaned by gargling and douching daily with normal salt solution to which, once daily only, a minute quantity of some antiseptic was added, either carbolic acid or bichloride (1:20,000). Strong disinfecting solutions are to be avoided. He was kept constantly supplied with a large gauze handkerchief soaked in bichloride solution, to receive any expectorated matter or nasal discharges; he was directed to hold the handkerchief in front of his mouth and nose while coughing or sneezing, in order to catch the spray. Urine and bowel discharges were disinfected and thrown overboard after standing the required time; the vessels cleaned out, disinfected and dried, ready for use. Any conjunctivitis, beginning otitis, tonsillitis, pharyngitis or bronchitis were at once taken in hand and treated accordingly and, while the patient was still lying down. To this latter precaution it is considered due that whenever our patients were well of the measles, neither conjunctivitis nor otitis nor bronchitis remained and they were ready for duty almost the moment they were able to leave their beds.

In the meanwhile, immediately after a patient was admitted

to the list of sick, the clothing he had worn and that contained in his bag, as well as his mattress and hammock were exposed to running steam for two hours. His boots and shoes, since leather dries up brittle after steaming, were simply sponged or washed out with a strong solution of bichloride (1:1000) and allowed to dry in the open air.

The first epidemic finding us without a steam sterilizer, a sixty gallon vinegar barrel was converted into a sterilizer. The difficulty experienced with it was that during the intervals, the wood became dry on exposure to the sun and the barrel leaked for quite a time when it was used again. Finally, an iron water-tank with a large top that could be removed and screwed down at will, was placed at our disposal. The inlet steam pipe was introduced a few inches beneath the top and the outlet pipe near the bottom. The latter was prolonged over the side of the ship to a few inches above the water line of the ship. This tank worked very satisfactorily and has been of the greatest use ever since.

All the measles patients were treated in the sick bay and, it may be of interest to note in this place, without any precautions being taken with regard to the possibility of their spreading the disease to other patients lying right next to them; nor were any other precautions taken by the attendants other than that they were warned to wash their hands and faces before sitting down and taking their meals and yet we can assert positively that in not a single instance was the disease communicated to anyone from any case of measles after the patient had once been put under the above treatment. The main point, then, in this treatment simply is that it directs special attention to the patient himself as being the fons et origo of the danger of the spread of the contagion and treats him accordingly. If I were to sum up in a few words the principles involved in the above treatment, I should liken it to the process involved in the preparation for an aseptic operation, but with the "tables turned." While, in an operation, the patient is in danger of becoming infected through the surgeon, his assistants and instruments, and everything is done to render them aseptic,—in the case of a patient with a communicable disease like

measles, it is exactly the reverse and we must do what we can to render his person and immediate surroundings as free from danger to others as is possible.

#### DISCUSSION.

MEDICAL DIRECTOR JOHN C. WISE, U.S.N.:—I shall detain the Association only for a moment. To those who have not appreciated the dangers and troubles of the treatment of infectious diseases on board ship I want to say that this paper is a very valuable contribution. It was at one time my experience on the southern coast of Corea to go down on the berth-deck of a ship, and in a very dim light put my hand on the forehead of a patient and find the shotted eruption of smallpox. At that time we were not so advanced in our views as we are today. If I had had the knowledge that Dr. Beyer has evolved in this paper I might have done differently. I advised the Captain to establish a hospital on shore, the epidemic increased, and as it turned out the ship was practically out of commission for some time. This paper shows how in our present division of ships we can separate disease and how we can treat it very much more successfully. I know that this paper will be of very great value to the naval service, and I am sorry that it will not appeal more strongly to the gentlemen who are not in the navy. (Applause.)

#### GUNSHOT WOUND OF THE FACE.

**D**R. Howard Lilienthal presented to the New York Surgical Society a boy, fifteen years old, who four weeks before had been accidentally wounded by a bullet fired from a 38-caliber bull-dog revolver at a distance of about six feet. The bullet entered the left cheek at a point over the root of the first bicuspid tooth. It emerged through the left auricle, just close to the base of the mastoid process at a level fully one-quarter of an inch above the auditory canal. It did not perforate or injure the mucous membrane of the mouth nor did it perforate or injure the walls of the auditory canal.

The case was an illustration of the remarkable course sometimes taken by projectiles of this kind. It was surprising that, with so large a bullet, no laceration of the mucous membrane of the mouth had occurred, and also that, although the auditory canal was in the direct path of the bullet, it was not injured. — *Annals of Surgery*.

## THE EXPANSION OF THE HOSPITAL CORPS IN WAR.

By MAJOR GEORGE E. BUSHNELL,

SURGEON IN THE UNITED STATES ARMY.

THE problem of the expansion of the Hospital Corps in time of war is one that presents many difficulties. Given a corps the size of which has been rigidly restricted to the requirements of the army in peace, how shall it be many times multiplied in size at the beginning of war and yet contain only expert and well-disciplined men? Stated in this form the problem is evidently insoluble, yet we desire to approximate as nearly as the nature of things will permit to a solution, and it may be of some interest to consider briefly the experience gained in the war with Spain and attempt to discover what lessons may be drawn from it.

On March 31st, 1898, the Hospital Corps consisted of 723 men of whom about 200 were non-commissioned officers, hospital stewards or acting hospital stewards;—now known respectively as Sergeants first class and Sergeants,—and the remainder were privates. When war was declared an enormous increase of this small body at once became necessary. In view of the great pressure for enlistment on the part of men who did not belong to the State organizations that were at first called out it might be supposed that there would be no difficulty in obtaining as many recruits as were desired. But the trend of enlistments was naturally to the line which alone is the army in the popular mind. Few, comparatively, knew that such an organization as the Hospital Corps existed and those who thought of enlisting in this corps were largely those who, by virtue of previous training in medicine, pharmacy, or nursing, had a strong bent toward medical matters. The few army surgeons who were stationed in the large cities at the outbreak of the war were soon sent to other spheres of duty and enlisting was done by officers of the line on the rec-



ommendation of examining physicians who often had no special knowledge of the requirements for the corps or interest in filling it. Moreover the enlisting was done in recruiting offices the personnel of which was taxed to its utmost to make enlistments for the line. In the office with which the writer was connected in April 1898 the recruiting party, aided by as many recently acquired recruits as the office could accommodate were able to prepare the necessary papers for but twenty-five accepted recruits per day. Consider also that the recruiting officer was under pressure to enlist for the line, that his efficiency was gauged by the number of men that he succeeded in enlisting for line organizations, and that to make enlistments for the Hospital Corps was, as it were, a work of supererogation on his part, and it need excite no wonder that the Hospital Corps was not quickly filled. Some very good men who afterwards rendered excellent service in Cuba were indeed enlisted for the corps but their number was almost insignificant in comparison with the needs of the service. A few State regiments were provided with a Hospital Corps but these detachments could not be mustered into the national service for lack of the requisite legislative action. The Hospital Corps before the war was composed almost entirely of men transferred from the line of the army. Hence to supply the needed increase recourse to transfers from the volunteers was very natural, indeed under the circumstances unavoidable. But here at once various difficulties presented themselves. The volunteers belonging as they did to State organizations were reluctant to leave their friends and fellow townsmen and enter an organization of which they knew little and which promised little in the way of glory. The fact that the Hospital Corps belonged to the regular army was a stumbling block. They had enlisted for two years while the term of service in the regular army was three years. Did the transfer operate to lengthen their term of service? The answer, of course, was that they could not legally be held for a longer period than that provided for in their original contract with the government. But in the absence of specific orders such legal considerations failed to satisfy. In some regiments the Colonels at first refused to consent to the transfer of

their soldiers, even though the men themselves desired it. In other regiments men were transferred with as little regard for their wishes as if the transfer were a temporary detail. Captains were ordered to furnish a certain number of men from their companies and too often complied with the order by selecting the most unruly and vicious men of their commands. When the war proper was ended and one volunteer regiment after another was ordered home for muster-out, the Hospital Corps men who had originally belonged to these regiments began to clamor to be retransferred to their former organizations or to protest against the injustice of retaining them in the service when their comrades were released. They sent members of Congress to the Surgeon General's office to right their wrongs or called upon every influential man upon whom they or their relatives had any shadow of a claim to write to the Surgeon General on their behalf. There was no peace until an order was published which granted the members of the Hospital Corps who had been transferred from volunteer regiments the right of discharge at the date of muster-out of their original regiments. Though it must be gratefully acknowledged that some Hospital Corps men from the volunteers rendered most excellent service it must also be admitted that an organization must have something to be desired in efficiency which contained some of the worst men in the army and in which even the better soldiers were, many of them, discontented, smarting under a sense of injustice in being forced into a corps against their will, or uneasy lest they be held to an uncongenial duty after their former comrades had returned to their homes. In fact the morale of the Hospital Corps was so unsatisfactory that it was thought best after the war was ended to permit the discharge of those who requested it even though their status was not such that they could demand discharge under existing orders, at the time that their requests were preferred, and to enlist Hospital Corps men afresh for foreign service. A concession to the prejudices of the volunteers was made early in the war, in the hope of facilitating transfers, to the effect that members of the Hospital Corps would be permitted to accompany the regiment from which they had been transferred when it was ordered elsewhere. Whether as a result of this con-

cession or for other reasons many of the colonels seemed unable to comprehend that men transferred to the Hospital Corps no longer belonged to their regiments. In many instances the Hospital Corps men who had been transferred from a volunteer regiment were brought home with it and mustered out, of course illegally, as if they were still volunteers. In other cases they were furnished illegal discharge papers or were sent by their former colonels to their homes to await discharge. Many men innocently remained for a considerable time in what was practically a status of desertion before their whereabouts became known. The disentanglement of the complications which arose from such unwarrantable proceedings was one of the most troublesome of the tasks that burdened the administration of the Surgeon General's Office after the Spanish war. Such and other similar errors were committed by so many officers that we must conclude that the status of the Hospital Corps as constituted in the war with Spain was difficult of comprehension for those not especially familiar with the legal aspect of military affairs.

We are I think warranted in saying that the attempt to constitute an efficient Hospital Corps by the system of transfer from volunteer troops in the late war was a failure. And must not transfers by wholesale from commands in the field everywhere and always have a similar result? In peace the plan works well. The soldier transferred to the Hospital Corps is selected by the surgeon under whom he is to serve and there is every inducement to make a proper selection. It is the fatal defect of transfers to the Hospital Corps in time of war that the selection is almost necessarily made by the commanding officer or the surgeon of the command from which the man is to be transferred. As the man selected is to be sent away from the command what can be expected but that one will be chosen in many instances of whom his captain wishes to be rid?

The need of military discipline for the members of the Hospital Corps has been recognized from the first inception of the Corps. It was seen that such discipline is more easily acquired in large organizations like companies of the line in which all the men can be treated alike, rather than in small detachments like

those of the Hospital Corps serving at military posts, in which the work of each man is specialized. Partly from such considerations and partly perhaps from the idea that Surgeons are not qualified to discipline men, it had always been the custom to require a year of service in the line before a soldier became eligible for transfer to the Hospital Corps. The need of men made it necessary to waive this requirement during (and after) the war. To secure for the large additions of recruits from civil life and of untrained volunteers the instruction and discipline of which they stood so much in need Hospital Corps schools were established in the Army Corps for the volunteers and at Washington Barracks and Angel Island for the newly enlisted recruits from civil life. All these schools did good service. The results obtained have, I think, done away once for all with the idea that Hospital Corps men need to be disciplined in line organizations previous to transfer to the Corps. In fact line officers have more than once admitted to me that the Hospital Corps men trained at the school at Washington Barracks were more soldierly in their bearing, neater in their dress and more self-respecting and well behaved than the soldiers of the line who served under similar conditions.

If then the Medical Department can successfully train its soldiers there is no reason why it should not be independent of other branches of the service and at least in time of war recruit its own men. At the first outbreak of war experienced medical officers and hospital sergeants with sufficient recruiting parties of Hospital Corps privates should be sent in accordance with previously formed plans to the large cities to recruit solely for the Hospital Corps. The recruiting offices if open in time to take advantage of the first wave of popular enthusiasm could, I believe fill the corps with desirable men in a brief time. The day after war was declared with Spain the recruiting office at Boston was besieged by such a number of applicants for enlistment chiefly for the Hospital Corps that two extra policemen were put on duty to keep the street open for traffic, and several hundred men might have been recruited at once if general authority had been granted to make enlistments, and if a special recruiting party had been on hand to perform the necessary clerical work.

It is probably best that the Hospital Corps should belong in the future as it has in the past, to the regular army. But there seems to be no good reason why each volunteer regiment should not have a small detachment of Hospital Corps men, say one per cent of its strength or twelve men for a regiment 1200 strong, who like the volunteer hospital sergeants should belong to the regiment. If present regulations obtain in the next war many otherwise desirable volunteers will be rejected on account of errors of refraction. Such men often will not enlist in the regular army, but they could be well utilized for the Hospital Corps detachment of their regiment.

Each volunteer regiment was provided with three Hospital Stewards who were non-commissioned officers of the regiment. These stewards were generally pharmacists. So long as they were kept with their regiments where their duties were mainly the rendering of first aid and the administration of medicines for minor ailments they did very well. When however the exigencies of the service made it necessary to assign them to hospitals, their inexperience at once became manifest and they proved to be of little use in hospital administration. There was so much difficulty in obtaining reports from volunteer regiments that when the U.S. volunteer regiments were organized it was arranged that one hospital steward of each of these regiments should be selected by the Surgeon General. Experienced acting hospital stewards or ex-hospital stewards were chosen for these appointments and did good service. It seems to me desirable to adopt the same course whenever U.S. volunteer regiments shall be assembled.

The number of hospital stewards allowed by law previous to the Spanish war was one hundred. This number was increased to two hundred at the beginning of the war and the provision of law that a candidate for the position of hospital steward must have served one year as acting hospital steward was amended to require but three month's service as acting hospital steward. Similarly the year of service in the grade of private of the Hospital Corps required by regulations before promotion to acting hospital steward was also shortened to three months, so that it was possible for an intelligent man to become a hospital steward

after six months' service. This period of probation was too short to train a man to become a competent hospital steward but the concession was necessary in order to fill the vacancies.

In the popular view the Hospital Sergeant is nothing more nor less than a pharmacist and this view is unfortunately shared by many officers of the army, as is shown, for example, in the fact that skill in pharmacy was the only qualification required of the hospital stewards in the regulations governing the organization of the U.S. volunteer regiments. Great pressure was brought upon the Surgeon General during the war to appoint hospital stewards and the qualifications of the applicants were invariably stated to be that they were pharmacists or physicians. Yet in war the hospital steward rarely had time to practice pharmacy, the dispensing of medicine,—reduced to its simplest form because most medicines are supplied in tablet form for field use—being left generally to some recently enlisted pharmacist.

Hospital sergeants if effective are generally placed in *administrative* positions, having control of hospitals, training and instructing large detachments of Hospital Corps men, caring for medical property or supervising the preparation of the voluminous reports and returns required from large hospitals. All these duties require the familiarity with army regulations and usages only obtainable through the experience of actual service. They must be well performed or the result is chaos. Hence no pharmacist or physician is fitted to become a hospital sergeant until he has served his apprenticeship in the Hospital Corps.

It is always easy to enlist pharmacists or at least druggists sufficiently skilled in pharmacy for all practical purposes. They can be made very useful as privates of the Hospital Corps. Having already mastered the most difficult of the branches of theoretical knowledge with which the hospital sergeant is required to be familiar, it should be easy to fit them to become non-commissioned officers of the Hospital Corps if they will recognize and apply themselves to overcome their deficiencies on the administrative side. The difficulty with pharmacists is apt to be that they hold themselves too good for the grade of private and attempt to become hospital sergeants first class at once generally

through political influence being too ignorant of the duties of the grade to realize their unfitness to perform them. The mistake of appointing men hospital sergeants first class on the score solely of their knowledge of medicines or medical matters is guarded against at present by the law above referred to which prescribes previous service as hospital sergeants and the passing of the prescribed examination before appointment. These provisions should by all means be retained if possible in any future legislation that may be sought.

In a war of greater magnitude than that with Spain the need of hospital sergeants will be pressing and most difficult to meet, for the capable sergeant first class is not easily found or quickly trained. In a protracted war it would no doubt be expedient to institute courses of instruction at the Hospital Corps Schools for privates who are approved candidates for promotion. But in the first stress of war when the expansion must be immediate, if civilian pharmacists and physicians can not fill the requirements how is the increase in the number of hospital sergeants to be obtained? Evidently since knowledge of administration is so important if some qualifications must be foregone under the pressure of an emergency the requirements as to theoretical knowledge are those which should be diminished in severity and the examinations for promotion to the grade of hospital sergeant should deal chiefly with the administrative and military side of the hospital sergeant's functions.

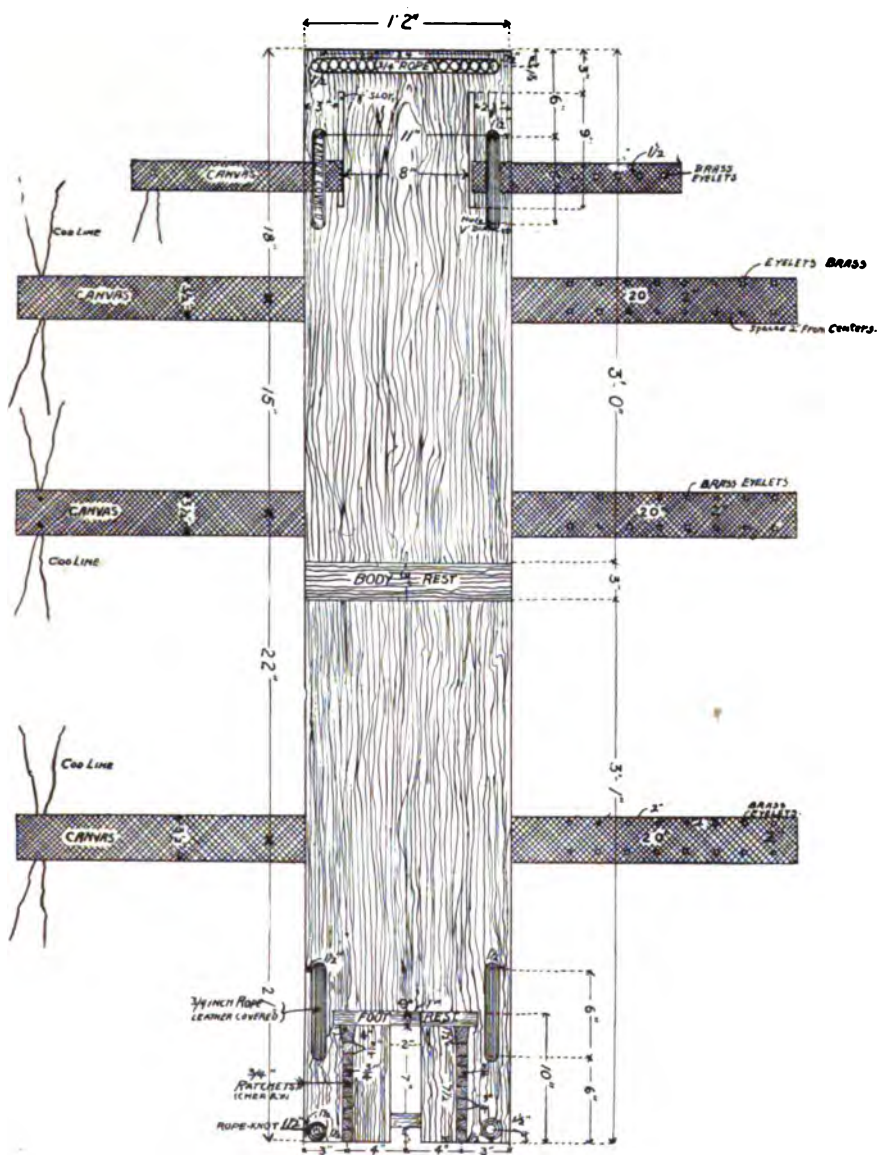
## THE UNITED STATES NAVY TRANSPORTATION BOARD,—1903 MODEL.

THE "Transportation Board" illustrated by the accompanying cuts, is the "Navy Transportation Board—1903 Model," adopted by the Bureau of Medicine and Surgery, for issue as a part of the medical outfit of vessels of the Navy. Its general construction, and special features were decided on after considerable study and experimentation, and it is believed that this "Board" is the most efficient, easily handled and simplest of any type hitherto used in the United States Navy. These "1903 models" are now being made at the U. S. Naval Laboratory, Brooklyn, N. Y., and are sent in sufficient numbers to vessels.

The prime essentials of a satisfactory apparatus for transporting sick or wounded aboard ship are, *lightness, ease of handling, simple and effective methods* for quickly securing the patient, *ample strength of materials and attachments*, and *adaptability to service conditions*. These are all possessed by the Navy Board, which, in addition, is simple in construction and use, and being made of materials commonly carried on aboard ships, can be made by the average "Ship's Carpenter." The Navy Board is so light that it can be easily carried to any part of a ship by one man; can be used in a vertical, horizontal or slanting position, can be raised or lowered any distance by ropes, or can be carried—with a patient—by four (or even two) men through narrow, tortuous passages, or up and down ladders. It can be used as a stretcher, either carried or pulled, its rope runners making it like a sled, or it may be slid down an inclined surface, controlled by guide ropes attached at top and bottom. A very important advantage of the "1903 model" is that the patient is comfortably supported, and the "rests" give him a feeling of security,—so necessary with nervous patients.

The construction of the "Board" is fairly well shown by the

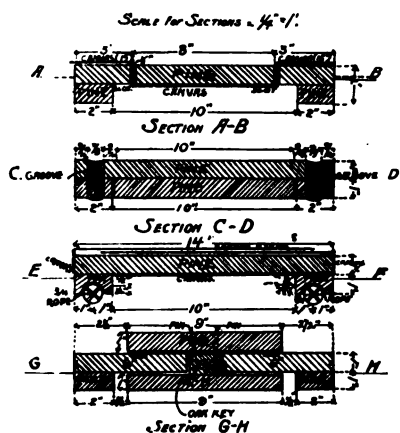




(Top View)

The United States Navy Transportation Board, 1903.

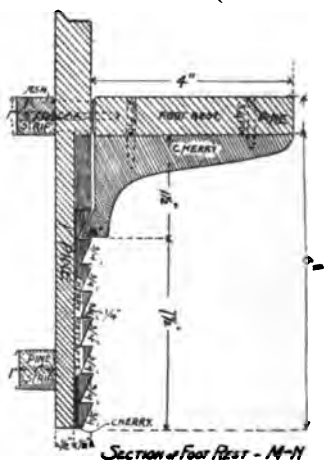
cuts accompanying this article. A few points require some explanation. The canvas strips, that are used to strap the patient to the board, pass across the back and are held in place by the

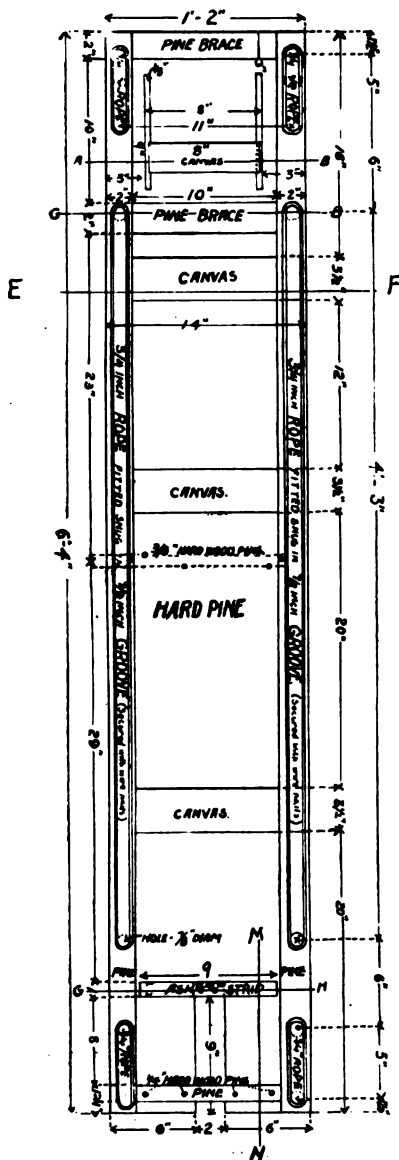


on the other. The three body straps are  $3\frac{1}{2}$  inches wide, and 20 inches long, on each side. The straps on one side of the board have rows of  $\frac{1}{4}$  inch brass eyelets (2 inches apart) along the upper and lower edges of the canvas; the straps on the other side have two 12 inch pieces of cord securely fastened near the ends at top and bottom, in line with the eyelet holes of the opposite straps. The method of fastening these straps is as follows: Draw the straps snugly across the body of the patient, pass one piece of the double cord through the nearest eyelet and tie it with the free end in a reef, or bow knot. Repeat with the lower cords and eyelets. The method is very simple, quickly executed, and holds the straps securely. If the straps are too long for a man, they are simply folded over so as to bring two eyelet holes in line, and the cords passed through them are tied as usual.

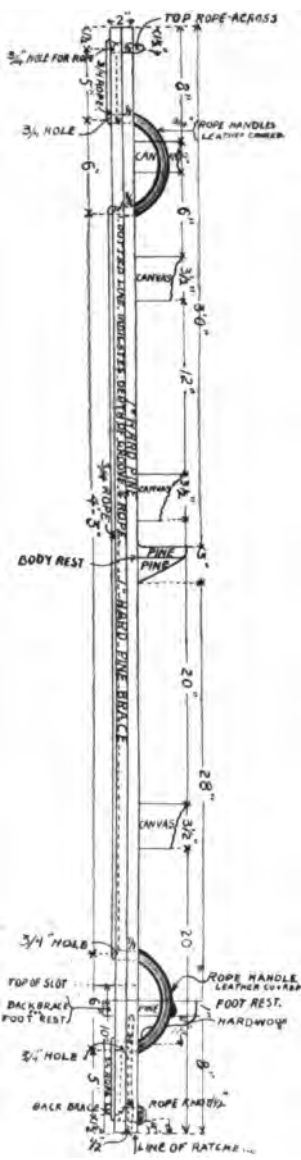
The "body rest," and the "foot rest," are very important features of the "Board".

side strips, under which they pass in grooved openings, so that they can be pulled from side to side. The head strap is brought up through slots cut in the main part of the board,  $\frac{1}{8}$  inch wide and 9 inches long, the slots being 8 inches apart. This head strap is 2 inches wide and 12 inches long on each side—it has a row of  $\frac{1}{4}$  inch brass eyelets on one side, and two 12 inch pieces of stout cord (cod-line)





(Lower View)



**(Profile View)**

**The United States Navy Transportation Board, 1903.**

The "body rest" is a piece of pine about 2 inches thick, projecting 3 inches from the surface, supported by a triangular shaped piece below. When a man is on the "Board," his buttocks rest comfortably on this rest and he receives considerable support from it.

The "foot rest" is a 1 inch board, 9 inches wide, and projecting out from the "Board" about 4 inches. A 2 inch square block fits in the opening at the bottom of the "Board," and connects the "foot rest" with a strip of ash on the back that keeps it from falling off, and holds the "rest" in a level position. On each side of the "foot rest" are triangular pieces of hard wood that have a projection at the bottom which fits into the spaces of the ratchets, on each side the central opening (see Section M-N), and are secured by long pins at the top to the "foot rest." On each side of the middle opening (which is 2 inches wide) are ratchets made from hard wood,  $\frac{3}{4}$  inch wide, and of the same depth between level parts. When the "foot rest" is raised slightly out from the "Board," the projecting end of the braces comes out of the ratchets far enough to permit the "rest" to be raised or lowered to its full extent, but if pressure is applied on top of the "rest," downwards, the projecting end catches in one of the ratchets and is firmly supported. The "foot rest" is held so strongly by this simple arrangement that no pressure, short of one that will break the wood parts, will cause it to slip—in fact, the greater the downward pressure, the more firmly it is held in place.

By means of the movability of the head strap and the foot rest, almost any sized patient can be secured safely, and comfortably, on the "Board." The body rest and side straps are fixed, their location having been determined by experimentation.

The "1903 model" is an improvement on the transportation board previously in use in the Naval Service, and known variously as the "Mahan" and "Ames" board. It is fully recognized in the Medical Department of the Navy that this transportation board despite its many advantages, has decided defects, the most serious of which is the material of which it is constructed. Its liability to be splintered, with consequent damage to the personnel, by a projectile, together with its combustible nature are serious defects. The subject is under consideration and it is hoped that further study will develop an improved means of transportation free from the objectionable features of the one now used.

## THE RESULTS OF TWO SEASONS ANTI-MALARIA WORK.

By LIEUTENANT FREDERICK F. RUSSELL.

ASSISTANT SURGEON IN THE UNITED STATES ARMY.

**I**N the numerous accounts of malarial mosquito work which are now appearing in the journals much has been said about the diminished prevalence of Malaria in the districts where such work has been carried out, but it has not been my good fortune to see any report which shows definitely the diminished sick-rate; and it has therefore occurred to me that our experience at Fort Washington, Maryland, might be interesting on account of the completeness and accuracy of our statistics. Fort Washington is an isolated community of about four hundred souls, mostly soldiers and the remainder civilian employees together with servants and the families of officers and soldiers; the actual number however being always accurately known as well as the number of sick and the cause of the sickness: such a community as this gives an ideal opportunity for the tabulation of the effects of anti-malarial measures.

The location of the Fort is on the left bank of the Potomac river thirteen miles below Washington, D. C. The reservation is about three hundred and seventy-five acres in extent and is made up mostly of hill and valley; in the center is a long, narrow plateau of perhaps fifty acres and on this is built the post proper; one end of the oblong slopes rapidly to the river while the other three sides are bounded by narrow ravine-like valleys which widen as they approach either the river or one of its two branches lying north and south of the point on which the reservation stands: the wide lower ends of these ravines were all alike in being marshy and covered with a thick overgrowth of cat-tails and swamp weeds and in having innumerable puddles of stagnant water in which a host of mosquitoes were accustomed to breed. The post is prac-

tically a new one and was until recently without a water or sewer system and had numerous cisterns and dozens of the inevitable water-barrels.

The first troops arrived there in July, 1897, and they brought their malaria with them from Washington Barracks and as the soil was favorable it immediately began to increase. The men were housed in some old barracks which were very imperfectly screened; as the number of troops was increased they overflowed into tents, which were altogether without screens; in the spring of 1901 two new barracks were completed and since that time two thirds of the garrison have been well housed in well screened buildings.

Up to July, 1901, very little had been done in the way of mosquito destruction, but during that month the Secretary of War authorized the use of mineral oil for the destruction of mosquitoes and their larvae, and the use of the ordinary illuminating oil was begun immediately and was continued throughout the summer:—this so far as I am aware was all that was done that year; yet by referring to the table of percentages of malarial sickness you can see that it improved conditions immensely.

This table of percentages needs a word of explanation. The changes in size of the garrison have been so many and of such relative magnitude that the absolute number of cases would fail to show the true conditions and I have therefore used percentages obtained in the following way:—the absolute number of cases of malaria admitted to sick report for any one month is divided by the average population for that month: no attempt has been made to separate new infections from recurrent cases and the records show that the same man has occasionally been admitted to sick report for malaria twice in the same month.

The average monthly rate for 1897 is much too high as it includes only the worst months, but by comparing the rates for ninety-eight, ninety-nine and nineteen hundred you will notice that the conditions were bad and steadily growing worse, having increased from 16.10% to 19.53%. The average of the first six months of nineteen hundred and one is not materially different from previous years but from that time on a steady improvement can be seen.

*RESULTS OF TWO SEASONS ANTI-MALARIAL WORK.* 159

TABLE OF PERCENTAGE-MALARIAL DISEASE—FROM JULY, 1897, TO JANUARY 1, 1903, AT FORT WASHINGTON, MD.

	1897	1898	1899	1900	1901	1902
January		8.69	3.17	3.30	12.71	2.06
February,		6.02	6.32	7.37	1.43	1.20
March,		2.40	7.81	1.39	4.78	.60
April,		3.76	10.93	11.47	15.89	1.08
May,		17.37	6.06	19.66	13.09	7.32
June,		4.45	15.23	22.13	14.33	3.85
July,	13.00	9.02	22.41	20.72	12.61	5.86 *
August,	35.98	16.66	33.89	33.82	5.57	4.20
September,	49.27	41.96	41.63	38.20	10.30	6.66
October,	51.42	51.31	35.24	40.56	17.48	10.69
November,	26.47	7.44	22.95	12.78	3.94	4.62
December,	18.57	3.75	14.63	8.96	1.49	1.94
Average,	32.24	16.10	18.35	19.53	8.63	4.18

The next year, nineteen hundred and two, we began petrolizing breeding pools about the first of April and continued it twice a month up to the end of the season. We soon, however, came to look upon oiling as a merely temporary measure and turned our attention to the making of permanent improvements. As the water and sewer systems were now practically complete all the water barrels were done away with and all small pools were filled in. The big marshes presented a rather difficult problem and it was

at first proposed to drain them by open ditches but the amount of work which would have been necessary to keep these open and free from weeds decided the question in favor of some system of sub-soil drainage. The plan finally adopted and carried out was the construction of an eighteen inch tile storm-sewer provided with numerous man-holes for storm water and connecting into these man-holes, a large number of three inch, open jointed, porous tile drains laid from one to three feet below the surface. This combination worked perfectly and converted our marshes into dry fertile bottoms suitable for gardens. This work was all done during the mosquito season but thanks to a daily inspection all new breeding places were promptly filled in by the contractors. In addition to this drainage work there were erected during the summer six buildings all but one of which had cellars; the parade ground was graded and about three miles of roadway was built; these two latter undertakings involved the moving of between sixty and seventy thousand cubic yards of earth. These are all operations involving the upturning of the soil which has always been considered as productive of an increase of malarial disease and yet reference to the table will show that the rate for the year was less than half that of the previous year during which the soil was not upturned to any thing like the same extent.

The improvement during the two years of work is well shown in the monthly average which dropped from 19.53% to 8.63% during the first year and to 4.18% during the last year. As October has always been the worst month it is interesting to notice the fall from 51.81% in '98 to 10.69% in 1902, a difference of over 41% for that month.

Another result of our campaign, which it is impossible to show in figures, is our comparative freedom from the swarms of *Culex* which formerly made life miserable for those who were fortunate enough to escape infection with malaria. The *culex* proved comparatively easy to destroy and it disappeared as soon as the water-barrels were removed and the cisterns oiled; the *Anopheles*, however, was a different matter, and in spite of all our work it appeared in numbers about the middle of August and we were forced to take refuge under mosquito bars at night. I found it breeding in rain-barrels once or twice but it came principally from tiny pools of water, hardly as large as one's hat, in the depths of the marshy woodlands; in places which it was practically impossible to oil; this



was discovered too late in the year to do very much in the way of drainage of these places, which I feel sure, is the only way to fight these insects. In April we found the *Culex stimulans* (Walker); in May the *Culex pugnans* and *triseriatus*; in June the *Anopheles punctipennis* and *maculipennis*; and in July the *Culex sollicitans*. These were all bred from the larva, except the last, and perfect specimens were thus obtained which made their identification reasonably sure. The difference between the *Culex* and *Anopheles* as described by Howard in his book on mosquitoes, both in the larval and adult stage, was so striking that the enlisted men of the hospital corps were all able to tell them at a glance.

So far I have dealt only with the mosquito side of the question, but there is another side, and that is a medical one which is almost equally important. An examination of the sick-report shows that the malarial cases are not equally distributed through the command but that they constitute a certain number of men who are repeatedly sick, month after month; it was to this class that our special attention was devoted. We at first gave every malarial patient on leaving hospital an amount of quinine sufficient for several weeks with directions as to how it should be taken, but this plan was almost entirely unsuccessful because of the ignorance, carelessness and indifference of many of the patients. Probably very little of the quinine so distributed was ever taken, and we therefore adopted the plan of ordering every malarial patient to present himself at the hospital twice a week for six weeks after being returned to duty when he received from 0.5 to 1.0 gram of quinine in solution. This worked perfectly and almost completely stopped the recurrent cases. The improvement in the percentage for June of last year over May we attribute mainly to this measure which was begun about that time.

All soldiers sick with malaria were kept in hospital and not permitted to remain in quarters and while there were kept under mosquito bars to prevent infection of the *Anopheles*, which sometimes got through our door and window screens. These screens, by the way, varied greatly in efficacy, as only those which were set on the outside of the window could be relied upon, since they permitted the sash to be raised and lowered without touching the screen.

While the improvement has been very great in this short time, we know that even our best figures are much too high, but from the results so far achieved we have no doubt but that in a few years the disease in this place can be practically stamped out.

MY FIRST AID TO THE WOUNDED: THE TRIP OF THE  
STEAMER S. R. SPAULDING, TRANSPORTING OUR  
WOUNDED PRISONERS FROM CITY POINT, VA.,  
TO PHILADELPHIA, AFTER THE SEVEN  
DAYS BATTLES IN 1862.

BY LIEUTENANT COLONEL HENRY O. MARCY

OF BOSTON.

FORMERLY MEDICAL DIRECTOR IN THE UNITED STATES ARMY.

THE news of the seven successive days of contest was followed by a universal wail of sorrow, as it swept like a storm-cloud over the land. The splendid army of young heroes which had been drilled for months was furnished and equipped for battle as never before seen, since the days of the Romans. Under their idolized commander, they had grappled with the flower of the Southern chivalry as they penetrated the sunken morasses in the lowlands of Virginia.

When the army slowly gathered itself together upon the banks of the James, a sigh of relief followed, and the whole country; as if actuated by a common purpose, sought to render both sympathy and help. The women gathered in the churches with their contributions of household linen and vied with each other in preparing dressings, for the still unknown thousands of wounded.

I was then a member of the graduating class in the Harvard Medical School and was one of a number who volunteered for emergency service. The call came, and in two hours after notice, a half dozen of us were journeying on a fast train to New York City. At midnight we reported at the house of Dr A. B. Mott son of Valentine Mott then one of the first surgeons in civil life in America. The urgent duties of his position had prevented his return home but Mrs. Mott was waiting to receive us. I shall never forget the charming cordiality with which she welcomed us at this unseemly hour and after furnishing us refreshments assigned us to quarters in the Saint Nicholas Hotel near by.

Our little party was soon broken up, never to meet again. I was ordered to the steamer S. R. Spaulding, then one of the largest and most famous of American passenger ships. She was a side-wheeler of nearly three thousand tons burthen.

After the suffering, incident to the novelty of ocean travel, we were on the alert, to see the capes of Charles and Henry marking the entrance to Chesapeake Bay. A few hours stop at Fortress Monroe permitted a brief visit to the fortifications, and the topmast of the gallant frigate Congress only a few feet out of water was the sad reminder of the historic naval battle between the Merrimac and Monitor. A few inches of a rope cut from the upper rigging was for many years treasured as a sad memento. Each point of interest along the James was studied with boyish eagerness as we steamed slowly by and came to anchor in front of the encampment of the Grand Army at Harrison's landing. The river was filled with transports of every description, and I thought that never before had I seen such a fleet of vessels.

The incidents of this new experience burned themselves into memory far more deeply than many more important events in which later I became a much more prominent actor. Days elapsed before we were permitted to receive our wounded prisoners under a flag of truce at City Point but each day was so full of novel experiences that to us they seemed to go all too quickly. We visited soldier friends upon the outposts and heard from their own lips the details of the campaign, studied the battlefield of Malvern Hill, etc.

One night upon the deck, a discussion arose among a party of distinguished civilians. Bitter criticisms were uttered upon the wicked waste of life in this "*negro* war" and at last General McClellan came in, spoken of in anything but complimentary terms. A hitherto unnoticed factor became prominent in the person of the guard, a very young soldier who had been quietly walking his beat. He brought to a close the discussion by very forcefully grounding his musket in front of the little party, and with flashing eyes forbade further discussion with the remark that General McClellan was his Commander in Chief; a note-worthy incident, since it was the exponent of the universal love with which McClellan was held by the entire Army.

Another night we found ourselves under fire, the sharp explosion of the artillery from the opposite shore of the river awakened us all in great excitement, but resulted in little harm. The next morning two thousand of Maine's stalwart soldiers armed with axes, under proper guard, were taken across the river, and soon the splendid forest which had sheltered the enemy's artillery was soon falling under the resounding blows, as grain before the reaper. The summons came. We were permitted to land at City Point and, after a little, several officers in gray uniforms came on board the vessel, and in seeming good feeling shared the hospitable drinks in the Captain's cabin, as they exchanged certificates for the long list of wounded men who were being taken on board on stretchers from the near-by train. Our ship had been especially prepared for the service; open bunks, in triple tiers, filled the entire space between decks, cots of straw with clean sheets and a blanket was the furnishing of each bunk. An experience which followed, to the end of the war gave no such picture of unmitigated misery. Nearly three weeks had elapsed since the fateful contest. Hours had lengthened into days before some of these poor wounded sufferers had been rescued from the battlefield where they fell. They had been huddled together in the Richmond tobacco warehouses as closely as floor space permitted. Soap and water had been denied them. No surgical attendance had been furnished them. The ration of corn meal and bacon was illy suited to their fevered condition. Urinary and faecal defilement made them in the last degree repulsive even to themselves. The common house fly settled in black swarms over the sufferers, and nearly every wound was literally alive with full grown maggots. In the reeking heat of these prison houses of hell, the demoniacal suffering was beyond description. Day by day death gave welcome release to some of the poor sufferers. Our steamer was loaded with those most seriously wounded. One hundred and four of these were assigned to my ward. Assisted by four orderlies the work began. The vermin-covered clothing was cut away and thrown overboard. Half barrels served as bath tubs to those strong enough to share them. Hot water and soap were used most plentifully and each poor fellow in a clean night-shirt was placed between clean sheets. Milk punch was served plentifully. Under the guidance of a senior medical officer

the gangrenous, suppurating wounds were treated in a manner peculiarly his own. This is worthy of description in a little detail, since it was a prototype of the antiseptic methods introduced a decade later. The wound was exposed to easy access, the bed having been properly protected by oilcloth, and was filled to distention with spirits of turpentine injected with a syringe. Its ostensible purpose was the killing of the maggots which it most effectually did, sometimes causing the expulsion of a teaspoonful or two in a wriggling mass. This was two or three times repeated, each night and morning, followed by a thick dressing of pulverized Peruvian bark. It is especially noteworthy to remark the change which ensued. The horribly offensive decomposing pus lost its putrid odor, and even in the short time of three days before landing in Philadelphia the sloughing wounds began to take on healthy granulations. The surrounding reddening area of tissue rapidly lessened with a corresponding improvement in the general condition. I extremely regret that the name of the senior surgeon has been forgotten, but he was a man of wide experience and told me that he had often noticed that putrid wounds in hot climates did exceptionally well under this, his original method of local stimulating treatment.

Ofttimes since have I heard in imagination the grateful thanks of these poor sufferers as they expressed their gratitude for their translation as they called it from hell to heaven, and their delight to be again under the protection of the old flag which they loved so well. Twenty-four hours followed before any rest from the wearisome service was granted us. Four of our poor sufferers in muttering delirium slipped the cable of life for the unknown shore, before the short journey was ended.

The telegraph had announced that we would arrive in Philadelphia early in the morning and every soldier of the number will remember to his dying day the welcome reception by the ladies of Philadelphia.

In long double rows, extending from wharf to the street, with sympathizing, tear-stained faces they each had a word or cheer, with some sort of soothing cordial to offer their fateful guests, as they were being conveyed to the ambulances awaiting transportation to the general hospital.

# Enno Sander Prize Essay, 1903.

## THE DIFFERENTIAL DIAGNOSIS OF TYPHOID FEVER IN ITS EARLIEST STAGES.

By MAJOR FREDERICK SMITH, D.S.O.,

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FOR IMPERIAL TROOPS WEST AFRICA; FORMERLY ASSISTANT IN  
PATHOLOGICAL LABORATORY, ARMY MEDICAL SCHOOL, NET-  
LEY; EX-MEDICAL OFFICER OF HEALTH, PENANG.

### Chapter II.

#### MALARIAL FEVER, SUNSTROKE.

**A** PART from the numerous cases in which a malarial subject contracts typhoid, and the converse—cases in which therefore the two diseases run more or less concurrently,—the one disease is frequently mistaken for the other. It is the continued or so-called remittent forms of malarial infection that give rise to this error. Under the head of febricula I have shown that some of our doubtful cases in South Africa were diagnosed clinically as ague. To soldiers this matter is most important as they are particularly liable to be called upon to serve in places where both these disorders are endemic.

It is no rare thing for a case of enteric to be treated throughout as remittent and the error remain undiscovered. Among cases noted by myself, for instance, are, 1st, a case in the Straits Settlements of a Chinaman, and 2nd, a negro soldier in West Africa, both of whom died of supposed remittent fever after some weeks illness. I attended the post mortems. They were typical typhoids. Men invalided from abroad for remittent are to be met with in our hospitals at home suffering from phlegmasia, which is in itself suggestive of typhoid. I have records of other so-called remittents which were undoubtedly (in my opinion) typhoids, but they recovered.

Some of our leading English writers on Enteric, (naturally perhaps, as they have little or no experience of it) do not mention malaria in connection with the diagnosis of enteric, but the military writers have a good deal to say about it. As a matter of fact, it is not very many years ago that nearly all the enteric in India was called malarial fever. The works of the older army physicians, too, show that the disease was called remittent in European wars of the eighteenth and early part of the nineteenth centuries, but that was when enteric was not very well known as an entity, but was included among continued fevers. Up to a comparatively recent date it was thought that a sort of hybrid between malarial and typhoid fever existed in the tropics. Sir Joseph Fayrer in 1882 wrote of the climatic or malarial form of typhoid fever.\* The common term was "typho-malarial fever.

Fayrer said "there is not much danger of confounding a remittent with well pronounced remissions with typhoid. The cases in which there is difficulty are the continued or continuous remittents." In the typical malarial forms "there is more chill or rigor, the malaise is greater, the temperature rising to 104° or 106° as early as the evening of the first or second day." "The anxiety depicted on the countenance of the specific typhoid is wanting." "These distinctions are not always well marked, and it may be quite impossible to establish these points of diagnosis." Murchison said, "the pyrexia of enteric fever is essentially remittent and cases have occurred in my own practice and been noted by Trousseau and other observers, especially in malarious countries, where it has put on at first an intermittent type." "Moreover, it may happen that cases of enteric fever, mostly mild, present the intermittent character from first to last \* \* " Other writers tell the same story.

The tendency of enteric in the tropics to commence like malaria has been so frequently noted that men have argued some climatic influence determining periodicity. No doubt a great many of the cases were really due to the lowering of resistance, consequent on typhoid poisoning having lit up an old malarial infection.

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\*Climate and Fevers of India. Fayrer. J. & A. Churchill, London, 1882.

Be that as it may, it is evident that the temperature is a poor guide to differentiation in the first few days.

From a somewhat extensive acquaintance with malaria and enteric, I can say that to me the diagnosis is often very difficult and only mere guess-work.

It is of little avail to say that a microscopical examination of the blood would settle doubts. As a matter of fact a negative pronouncement as to malaria would not do so. It is quite a common experience to be unable to find distinct evidence of recent malaria in one or even two blood examinations. In any case, this examination takes time, and can rarely be carried out on field service except at base hospitals. Those gentlemen who say that no case of possible malaria should be treated before resort to microscopical evidence, can have had no experience of "soldiering." They might lose valuable time, and their patients while hunting for the *haemamaeba*, whereas the man who promptly uses quinine if the fever resembles malaria is on the safe side. He can do no appreciable harm and may save life. Where it is practicable, however, an attempt should be made to establish a positive diagnosis of malaria by the use of the microscope.

The most difficult cases are in my experience the so-called bilious remittents. In these, the temperature is often low, there is diarrhoea (the stools may be dark, but we find *that* not infrequently in tropical typhoid during the first week), vomiting, foul tongue, etc. An experienced man will generally make a correct diagnosis, but the best of us may fail to do so at once. I have seen cases which I was certain were typhoid, whereas my colleague was equally convinced they were malarial.

I cannot do better than quote Maclean in regard to the distinguishing features. \*He says:-

"The most distinctive diagnostic symptoms between enteric fever, pure and simple, and malarial remittent are as follows:

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\*Diseases of Tropical Climates. Maclean. Macmillan, London & New York. 1886.



ENTERIC.

MALARIAL REMITTENT.

Onset gradual, no rigors, only sense of chilliness.	Onset more sudden, rigors not distinct.
Rise of temperature gradual, maximum not attained for days.	Rise much quicker, attaining maximum in a few hours.
Evening rise of temperature and morning remission; difference between morning and evening temperature not more than a degree or one and a half, at a later period as much as two and more.	Morning fall of temperature amounting to three or four degrees.
Heat of skin not distinct to hand, even when thermometer indicates that the blood is many degrees above normal.	Skin hot and pungent to hand.
Headache moderate, face slightly flushed.	Headache severe, face flushed.
Tongue coated in centre, red at tip and edges, redness increasing as case advances.	Tongue foul throughout.
Tenderness and gurgling in right iliac fossa not always present.	Absent.
Abdomen tumid and splenic dullness early.	Abdomen not so tumid, epigastric oppression marked, spleen also enlarged.
Diarrhoea the rule, motions sometimes bilious, sometimes pale brown with flocculi.	Constipation the rule.
Pulse and temperature do not always correspond.	Pulse and temperature more nearly correspond.
Enteric fever not much if at all under control of remedies as to duration.	Remittent fever can be cut short by remedies at an early period."

I have omitted part of Maclean's list, which refers to the later stages. I give his statements for what they are worth.

My own experience is that the best way to settle the question is to treat a doubtful case promptly as malaria. If calomel, quinine, etc., judiciously administered by experienced hands do not cure the fever in four days, or at any rate bring about marked improvement, the case is, in nine cases out of ten, not malaria at all. In most of the few purely malarial cases which resist this treatment the patient is going to die.

In Chapter 4, I gave a *Blackwater Fever* chart, which closely resembled enteric. I mention this here, but I am by no means convinced that the disease is malarial. Anyway, in less than four days every blackwater case can be diagnosed from enteric beyond a doubt.

SUNSTROKE, is not likely to be thought to be typhoid, but typhoid may be mistaken for sunstroke. I remember only one instance of this. A stout trooper was carried into hospital. He had been found comatose in his tent in South Africa. He could not be roused, his face was congested, pupils half contracted, breathing stertorons, temperature  $105^{\circ}$ , and so on. He was put in a cold bath and gradually came to his senses. He went through a typical course of enteric. No diagnosis can be made in such a case until coma is ended, but then the truth will soon be apparent.

### Chapter 12.

#### PLAGUE; OTHER DISEASES WHICH HAVE BEEN MISTAKEN FOR TYPHOID; CONCLUSIONS WITH REGARD TO THE CLINICAL DIFFERENTIATION OF TYPHOID.

PLAGUE.—I have seen but one case of this disease, and this only in the fully developed stage. A severe typical case of plague is not likely to be sent into the enteric wards. Enteric patients have, however, been erroneously called plague. An ordinary case of this disease will be indicated by the appearance of glandular swellings on about the second to fourth day. The onset of the malady is sudden as a rule. There is chilliness or a rigor, headache, vomiting, backache and pains in the limbs, congested conjunctivae, and a rise of temperature. This suggests typhus, malaria or smallpox rather than typhoid. The symptoms, apart from the condition of the glands, are, however, met with in many fevers, but in plague they are urgent and accompanied by great prostration. Usually also there is mental confusion at a very early stage—almost from the onset in fact. The tongue is sometimes "coated as with cotton wool or pointed at the tip with red edges and thickly furred in the centre." (Radcliffe & Payne in Quain's Dictionary, 1894). \*Cantlie says much the same, "a white-coat-

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\*Signs and Symptoms of Plague. James Cantlie. Govt. Printing Works, Pretoria, 1901.

ed tongue with reddened edges and tip." The tongue is no guide, then, or is too much like that of typhoid. In practically all plague cases, however, except the pneumonic, some of the glands are swollen to visible buboes, or are inflamed and tender on pressure, and this is the cardinal diagnostic sign. The pneumonic cases will be diagnosed pneumonia rather than enteric. The discovery of the plague bacillus in the blood, sputum or glands would settle the question, but this is not always practicable. A case with no symptoms which are not common to typhoid should not be pronounced plague unless by bacteriological means. Cantlie, who has had great experience, seems to think plague very unlikely to be mistaken for typhoid. This is all he has to say on the subject: "Typhoid fever, even may be confounded with what is called the 'typhoid' variety of plague, but a 48 hours study of the temperature will generally suffice to differentiate the diseases." Of the temperature he says it "may continue to rise say from 101° F. at the onset to 103°-105°-107° F. during the first two days, or it may reach 105° within a few hours after invasion. After three to five days the temperature usually falls to near the normal." I think he is a bit too sanguine about the value of temperature alone. Moreover there are, as he implies, cases in which the temperature is not so distinctive. I should prefer to rely on the gland signs in conjunction with other symptoms as already described.

**NEPHRITIS.**—W. Osler has mentioned typhoid nephritis, in which the disease begins like ordinary kidney inflammation with pyrexia, and the typhoid symptoms develop a week or ten days later. These cases must be very rare unless they have hitherto been overlooked. Clinically the diagnosis can only be made by waiting, but the methods discussed in Chapter 13 are available to solve such cases. Indeed it may be that by more extensive resort to scientific measures in diagnosis nephritis will be proven to arise from typhoid infection more frequently than it has been hitherto supposed to be.

**PARATYPHOID FEVER** is a disease of which I have no personal experience. It appears to be an irregular fever, liable to relapses, and characterized by an eruption indistinguishable from that of ty-

phoid. The motions are not like those of typhoid. There is pain in the splenic region, sometimes with enlargement together with rheumatoid pains and in some cases wandering oedema. The pyrexial periods are not quite so long as in typical typhoid, but otherwise it would seem to be unrecognisable with any certainty by clinical methods only. See Chapter 13 for other means of differentiating it.

There seem to be very few diseases accompanied by temperature which have not been now and again wrongly diagnosed as typhoid. Among additions to those already described may be named Liver abscess, Hepatitis, Secondary Syphilis, Measles, Scarlet Fever, Mumps, Tonsilitis, Erysipelas, Yellow Fever, Dengue, Rheumatic Fever, etc., but these are surely not liable to be so confounded for more than 48 hours, at all events, except where concurrent with typhoid, if ordinary care be taken, and I shall not discuss them here.

To resume in brief. The general conclusions I come to with regard to the differential diagnosis (on clinical grounds alone) of typhoid fever in the earliest stages are as follows.

- 1 That the diagnosis of typhoid fever in the earliest stages of the disease presents probably greater difficulties than that of any other specific, infectious ailment.

2. That there is scarcely any disease accompanied by fever which has not been at times mistaken for typhoid fever.

3. That a good many cases are wrongly diagnosed owing to mere carelessness or to want of knowledge.

4. That the disorders most liable to be confounded with typhoid fever are:—typhus fever, tuberculosis, pneumonia, influenza, febricula, or unnamed continued fever, Malta fever, malarial fever and paratyphoid.

5. That it is frequently impossible by non-bacteriological methods to differentiate between typhoid and the diseases named above in four days or even a week and more.

6. That our safety, from a public health point of view lies in regarding all doubtful cases as typhoid until they have been proved to be something else.

7. That the anomalous cases are more numerous and the difficulties in the way of diagnosis greater, in military than in civil life.

A tentative diagnosis is arrived at mainly by a process of exclusion. That is to say a good many of the diseases already detailed have some features which enables the diagnostician to recognise them; on the other hand, the absence of the distinctive characters of these diseases strengthens the probability of a typhoid origin. Thus the problem is narrowed down to the residuum of cases which are not typically typhoid, but are in the clinical sense on the borderland of this, and one or more other diseases. It is this residual class which is the source of so much indecision. At the same time, it must be conceded that cases which present all typical signs of the disease, sometimes prove to be not typhoid. There exists, therefore, pressing need for some certain method which will enable us to settle these doubtful cases. Whether we do or do not now possess means of deciding all or a goodly percentage of them will be discussed in the next chapter, which will be devoted to consideration of the value of chemical and microscopical methods, (including serum diagnosis) in the early recognition of typhoid.

### Chapter 13.

#### CHEMICAL REACTIONS AND MICROSCOPICAL METHODS (INCLUDING SERUM DIAGNOSIS) IN RELATION TO THE EARLIEST STAGES OF TYPHOID FEVER.

Ehrlich considers a deep red colour of the urine with *diazobenzol-sulphonic* acid or with sulphanitic acid of diagnostic value as characteristic of typhoid, measles and tuberculosis.

Jaksch and Cagney consider it of no use diagnostically.

Capt. Hughes\* found it useful in respect to Malta fever. In enteric in the early stages he found this color marked and the froth salmon pink; the sediment after 24 hours being greenish rusty brown. In Malta fever the color in froth or fluid was orange or mahogany brown, never decidedly crimson. The precipitate was never greenish. Arneill (Amer. Jour. Med. Science, Mar. 1900)

\*Loc. Cit.

†Bact. Exam. of Water. Major Horrocks. Churchill, 1901.

thinks the reaction of value, especially in severe cases. Other observers have reported favourably on this sign, while some have found it not reliable, and state that it occurs in many fevers. On the whole I should consider this reaction of little practical value to the military surgeon, as its strongest advocates admit it occurs in other diseases besides typhoid. A better one is described further on—the serum reaction. The *blood* of typhoid patients contains the bacilli, but the recovery of bacilli from the peripheral blood is uncertain. For early diagnosis it is of no practical utility.

The *faeces* and the *sputum* have seemed to me to be equally unsuitable for throwing light quickly on diagnosis, particularly in the field. After recovery of a likely bacillus it takes time to prove that it is not the colon bacillus or other organism. †Koch, however, has recently brought forward the method of Drigalski and Conradi and asserts that he can accurately diagnose in from 20 to 24 hours by the recovery of the organism from the faeces. He cultivates on a medium impregnated with litmus. This gives a color distinction between the acid producing colon bacillus and the alkaline-remaining typhoid bacillus.

The suspected bacillus is then tested with anti-typhoid serum. This method reads well, but has yet to be confirmed. Anyway, it seems complicated. Plans entailing cultivation of bacilli should be avoided if possible, except in the laboratory. A simpler method is to be preferred.

The *urine* of typhoid fever patients was shown by Professor A. E. Wright and Major Semple of Netley to contain the bacilli. Dr. Horton Smith\* of London and others confirmed this. The bacillus is, however, not invariably and easily found. I am not aware that it has been recovered from the urine in the very early stages of the illness. In cases of typhoid nephritis, such as that of Dr. Osler's already alluded to, the bacilli would probably be obtained early. Anyway, the process is, I should say, not of much use in military practice. The serum test is more convenient and trustworthy.

I have little practical acquaintance with the foregoing tests, but in the one now to be discussed I have done a good deal of

\*Lancet, 27, July, 1895.

practical work, mostly in the later stages of disease and among convalescents invalided from abroad, and have found it of great utility.

**SERUM TEST.**—The clumping, agglutinating, sedimenting effect of the serum of the patient upon the bacillus typhosus in emulsion or suspension has now become a recognised method of assisting in the diagnosis of typhoid.

This method is too well known now to need description here. As to its value in the detection of typhoid fever there is no doubt. More, some of the diseases most liable to confusion with typhoid have their own specific serum reaction, and can by it be eliminated from the doubtful cases. The micrococcus Melitensis, for instance, is sedimented by the serum of the Malta fever patient (A. E. Wright and F. Smith, *Lancet*, 6 Mar., 1897). Shiga's bacillus is sedimented by dysentery serum; Colon bacillus by serum of fever due to its operation; Bacillus of Schottmuller by serum of paratyphoid disease, etc., etc.

The questions we have to deal with are :—

1. To what extent is the serum reaction reliable?
2. Of what value is the method in the earliest stages of the disease?
3. Is it of any practical worth to the military physician?

With regard to reliability, I think I shall not err in stating that the serum reaction is present at some period in the course of 99 per cent. of typhoid fever cases. Professor W. H. Welch of Johns Hopkins University, said in his Huxley Lecture: "The occurrence of paratyphoid fever as a distinct disease affords an explanation of a certain proportion of the failures of the serum from supposed typhoid fever patients to clump typhoid bacilli."

Grunbaum (*Lancet*, 29 Mar., 1902) says he has never seen positive results with a 1.33 dilution and half-hour time limit where typhoid, past or present, could be definitely excluded.

Some evidence of the value of the method may be obtained by a study of Professor Wright's inoculation records. In this operation typhoid toxins in the shape of broth culture sterilized by heat, but not filtered, are injected under the skin. The result is in reality an ephemeral attack of typhoid fever and this is followed by a serum reaction indistinguishable from that due to the disease as ordinarily acquired. We find that in a small pro-

portion of persons there is no perceptible serum effect after inoculation.\* We may safely assume that the same holds good in typhoid fever. All the evidence indeed tends to show that there are some cases which do not show the reaction and that these, moreover, are the worst cases—they die on account of their physiological inability to manufacture antitoxin in response to the stimulus of the toxin.

This is analagous to the behaviour of the human organism with regard to other diseases. In a paper by Major Birt, R.A. - M.C. and Capt. Lamb, I.M.S., for instance, are given two fatal cases of Malta fever. In both of them agglutination was absent during a part of the illness. The micrococcus of Malta fever was recovered from each spleen post-mortem.†

Koch says the Bordet-Gruber-Durham reaction often fails in mild cases. A. C. Abbott, Philadelphia, found the error in 4154 cases 2.8%. Delepine, Manchester, in 400 cases found 3% doubtful as compared with clinician's 50%.

Serum diagnosis is inapplicable in the case of patients who have recently undergone anti-typhoid inoculation, or have previously suffered from an attack of typhoid fever. It is clear, for instance, from what has been stated above that the serum of a Malta fever case might react to the typhoid, and not to the Malta fever organism; but such an occurrence would be infrequent.

With regard to the first question then: The serum test is not absolutely reliable, but the reaction is obtainable in the vast majority of cases.

From a considerable practical use of this method I conclude that it is far and away the best available means of diagnosis. The number of cases which escape us under this plan of differentiating and also fail to be revealed by clinical data must be very small indeed.

Concerning the value of the clumping sign in the earliest stage of the disease, it may be noted that Professor Wright found a definite bactericidal serum effect in the majority of a series of anti-typhoid inoculations 24 hours after the injections. Pallard (Rev. Med. de la Suisse Rom., 20 Aug., '02), found the reaction present in one case on the fourth day—the day of admission; it

\*Anti-typhoid Inoculation. A. E. Wright. *Lancet*, 14, Sept. 1901.

†*Lancet*, 9 Sept. 1899.



had not been sought for earlier. In two cases of Malta fever, one of the diseases to be differentiated, investigated accurately from the onset, the specific serum reaction of that disease was highly marked (up to 400 and 1500 fold dilutions respectively) on the fourth day of fever. Wright and Semple,\* however, as also Durham†, in some animal experiments did not find any effect till the fifth day. Major Alldridge‡, too, in a case at Malta, did not get the reaction before the fifth day.

Capt. J. G. McNaught, R.A.M.C. (Army Med. Report, 1899) in cases clinically well-marked found a complete reaction in the only two cases examined on the fourth day. In one the reaction on the fifth day was imperfect, and in another on the sixth day. Among clinically doubtful cases: 2nd day, 1 imperfect. 3rd day, 1 well marked. 4th, 1 negative (afterwards became positive; patient had hemorrhage from bowel but recovered). Others were positive on 5th to 6th day. He concurs with Cabot that the reaction is obtainable in the majority of cases on the day of admission.

At the Massachusetts General Hospital some 90% showed the reaction on the day of admission.

Koch (Address, Kaiser Wilhelm Academy, 28 Nov. '02) says a positive reaction is not generally obtained before the second week. He is more or less in opposition to the rest of the world in this view.

Question 2. may, I think, now be answered as follows:

The serum test is of great value in the earliest stages of the disease. Few cases will not show the reaction by the fourth day. Those which fail to react will be the most severe ones, about which there is the least doubt clinically.

Now as to the practical value of this admittedly excellent means of diagnosis to the military physician.

We can state off-hand that serum diagnosis can be carried out with sufficient accuracy for clinical purposes almost as well in a military Base, General or Stationary Hospital as in a Peace Hospital. I say almost, because there may be some inconveniences in canvas hospitals in bad weather. Since Professor Wright of Netley showed that dead bacteria can be used in this test, the

\*Brit. Med. Journal, 15 May, 1897.

†Journal of Pathology, Dec. 1898.

‡Lancet, 21 May, 1898.

necessity for a cultivation outfit in the field has gone. It then becomes with regard to the above-mentioned classes of hospitals mainly a question of sufficiency of personnel. Unless a man can be spared for this kind of work only, there will be little of it done. My experience of war has been that it is often impossible to get enough medical men to do the essential clinical and ward work.

With regard to mobile forces, I am of opinion that microscopic work is of so little practicability that the slight advantage to be problematically gained from it would not justify the outlay in microscopes, etc. Practical soldier doctors will appreciate this fact without my going into details. It may be thought that some little could be done by sending dried blood or pipettes of blood through the post to the nearest non-mobile hospital. We might by this means get some belated information with regard to obscure cases, but it would not help us with regard to diagnosis in the earliest stages; be the postal system to the base never so regular, a mobile force cannot have a daily post as a rule. Before the answers with regard to a case could be received, the patient would have gone down country in a sick convoy. Undoubtedly it would instruct us with regard to after treatment of convalescents. Sometimes men return to duty after a short fever and are brought back owing to occurrence of perforation. But this is outside the subject of the essay, and in any case convalescents are at the permanent Hospitals and not with the mobile troops.

In the field the medical man must rely mainly on his clinical acumen and the soldier must run the risks for which he receives his country's gratitude, honors and rewards.

The moral is that the best practical clinician makes the best military medical officer. But, let me hasten to say, his clinical work will be conducted the more intelligently if he possess bacteriological knowledge.

I have left out of question the cases which present no symptoms of illness. As they will not come before the doctor, he will not be required to give an opinion. Such methods of discovering cases as those of Koch in which all the friends and relations of the 8 patients notified in a village had to submit their faeces for examination, are not likely to be allowed at present in an Anglo-Saxon community.

## Reprints and Translations.

### THE DISPOSAL OF THE WOUNDED OF CAVALRY.

LIEUTENANT COLONEL H. G. HATHAWAY, R.A.M.C.

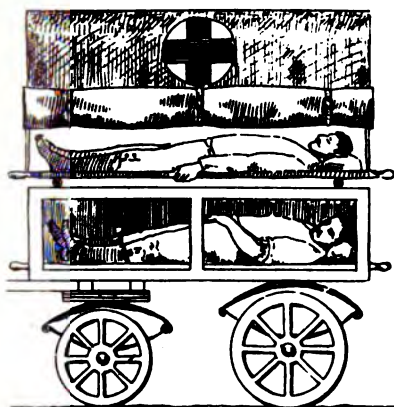
**I**N an article in the October *Journal of the United Service Institution of India*, Lieutenant Colonel H. G. Hathway, R.A.M.C., continues the subject of mounted bearer work treated of in the last volume of the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS and accompanies the paper with illustrations showing the latest improved form of his ambulance cart. It consists of a light strong platform on strong springs over four wheels; the sides of the car hinge down Irish car fashion. Cushioned seats let down from the middle of the platform provide comfortable sitting accommodations for four cases on each side, and there is a seat in front for two more cases. A double awning cover, supported on uprights in the center of the platform, allows stretchers to be loaded from each side, without any obstruction.



**Ambulance Cart.—End Elevation, with Seats in Use and Flaps rolled up.**

a. Stretchers rolled up and placed between backs of seats.

The sides and seats are hinged up when stretcher cases are carried, and one stretcher rests on the platform on each side



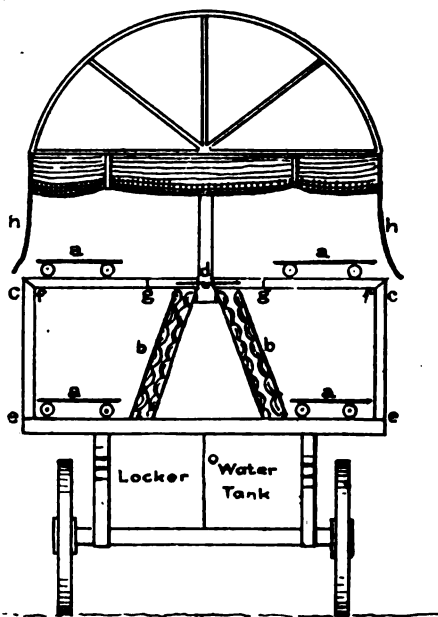
**Ambulance Cart.—Side Elevation, with Stretchers in Use and Seats folded up.**

The foot-board is hinged up and hooked to center of cart, thereby forming a platform on which the upper stretcher is placed. The stretchers are secured to the cart, and the patient on the upper stretcher buckled to it.

in the center of the cart  
Lockers underneath the  
cart carry the patient's  
arms, a two gallon water  
tank and a small amount  
of necessary equipment.

The great mobility and uncommon carrying capacity of this cart is apparent at once. The jaunting-car feature is a most excellent adaptation to ambulance purposes, providing additional breadth and comfort for the disabled.

while another is placed above on each side on the footboard that has been hinged up and secured to the center of the cart. The cart will then carry four lying down cases, all easily got at from the sides, and two sitting up cases in front—or ten sitting up cases, or two lying down on one side and six sitting up. Stretchers are to be carried when not in use folded between the sides



**Ambulance Cart.—End Elevation, with Four Stretchers ready for Use and the Seats folded up.**  
a. Stretchers; b. seats folded up; c. foot-board folded up, hooked at d, and hinged at e, f and g;  
h. side flaps lowered.

## JAPANESE AND RUSSIAN MILITARY MEDICAL MATTERS.

THE military medical arrangements of the Japanese army are, says the *British Medical Journal*, so much up to date as to be scientifically comparable with those of any nation, while in point of generosity in the provision of medical officers, elasticity and adaptableness to varying conditions, the difference is perhaps in favor of Japan. Thus while base hospitals, field hospitals, dressing stations of three types, bearer companies and hospital ships, all find their place, each division of the army has a medical reserve, which is mobilized simultaneously with it, and serves in the base or reserve hospitals. The medical department also has its own independent transport, and every infantry regiment, cavalry, artillery, engineer, and general transport battalion has a medical staff attached to it of a very complete kind. The staff, for instance, for an infantry regiment consists of 2 surgeon-captains, 4 surgeon-lieutenants, 3 chief attendants, 12 ordinary attendants, and 48 bearers drawn from the regiment. Besides all these standing arrangements the regulations provide for an automatic addition to the personnel of the hospitals in accordance with the number of patients present, without reference to headquarters. Moreover, so long as a military medical officer remains in chief command additions may be made from the civilian population; everything, too, is done to facilitate the co-operation of the Japanese Red Cross Society.

The Russian arrangements are also good upon paper, and Russian military surgeons have an advantage over the majority of their European colleagues inasmuch as they habitually do the work of nearly all the civil hospitals. It is not to be forgotten, however, that the Russians have to work at an immense distance from their real base as far as medical matters are concerned.

When all is said, the amount of mortality and suffering to be provided for in the war is dreadful. Of what it was likely to be in a naval combat we had a glimpse in the report on the Chino-Japanese war by the Director-General of the Medical Department of the Japanese Navy. A single shell killed two medical offi

cers and 12 men, besides wounding 28 others. On land, too, the casualty-rate seems to be abnormally high, since it is doubtful whether the mass of Russian soldiers are sufficiently intelligent to fight well in very open order, while for the Japanese,—the Gourkhas of the extreme East,—though the rank and file are of high intelligence, they are credited with a love for close quarters, and with regarding death in such a way that even discipline, perhaps will not induce them to take the precautions against it which are considered right and legitimate further west. The amount of sickness, on the other hand, may possibly be less than under corresponding circumstances elsewhere, for both nations are habitual tea drinkers, and in consequence rarely drink un-boiled water.

It is also interesting to note that the International Convention relating to hospital ships was signed at the Hague on July 29th, 1899, by Russia and Japan. It was provided that military hospital ships that is to say, ships constructed or assigned by States specially and solely for the purpose of assisting the wounded, sick, or shipwrecked, and the names of which shall have been communicated to the belligerent Powers at the commencement of or during the course of hostilities, and, in any case, before they are employed, cannot be captured while hostilities last, Hospital ships equipped wholly or in part at the cost of private individuals or recognized relief societies are also privileged.

The treaty provides that no hospital ship must in any way hamper the movements of the combatants, and during and after an engagement they must act at their own risk and peril. All military hospital ships are to be distinguished by being painted white outside with a horizontal band of green about a metre and a half in breadth.

With regard to other vessels whose owners assist the wounded, it is provided that neutral merchantmen, yachts, or vessels having or taking on board sick, wounded, or shipwrecked of the belligerents cannot be captured for so doing.

The religious, medical, or hospital staff of any captured ship is inviolable, and its members cannot be made prisoners of war. On leaving the ship they may take with them the objects and

surgical instruments which are their own private property. These staffs may continue to discharge their duties so long as may be necessary, and can afterwards leave when the Commander in Chief considers it possible. Further, the belligerents must guarantee to the staff that has fallen into their hands the enjoyment of their salaries intact.

The position of the wounded also is somewhat ameliorated by the treaty, which provides that sailors and soldiers who are taken on board when sick or wounded, to whatever nation they belong, shall be protected and looked after by the captors. The shipwrecked, wounded, or sick of one of the belligerents who fall into the hands of the other are prisoners of war. The captor must decide, according to circumstances, if it is best to keep them or send them to a port of his own country, to a neutral port, or even to a hostile port. In the last case prisoners thus repatriated cannot serve as long as the war lasts.

#### LATER STUDIES OF THE ANOPHELINAE.

THE study of the mosquito has progressed so rapidly that Colonel Giles has found it necessary to issue a fasciculus supplementary to his comprehensive Handbook of the Gnats or Mosquitoes, issued about a year ago and which is devoted entirely to the discussion of additional information upon Anopheles.

#### MEDICAL PROGRESS.

THE issue of the *Interstate Medical Journal* for January, 1904, is deserving of especial notice because of its very unusual character, being devoted entirely to a review of the medical literature of the past year prepared by the Editorial Staff of the Journal and issued in twelve departments comprising a most scholarly and valuable addition to the medical literature of the year.

# Medico-Military Index.

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**Gruner (R. B. H.)** [Suicide in the German army.] Berl., 1903, O. Franche, 40 p., 8° \*

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**Goyens.** [Conscription as a prophylactic factor against tuberculosis.] *Ann. Soc. de méd. d'Anvers*, 1903, lxxv, 115-125.

**Kulcke.** [Treatise on military hygiene for the use of officers.] Hamb., 1903 *Lüdeking*, 159 p. 12°.

**Kümmel (H.)** [The question of military dentists.] *Deutsche Zahnärztl. Wchschr.*, Berl., 1903, vi, 385-388.

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**Morkotun (K.)** [Struggle with tuberculosis in the army and navy.] *Med. pribav k. morsk. sborniku*, St. Petersburg, pt. 2, 145-155.

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## Editorial Department.

### The Surgeon Generals of the United States Army

V. RICHARD ALLISON, SURGEON TO THE LEGION,  
1792-1796.

THE infant republic, at the close of the War for Independence, neither desired nor needed a large military force and the army was reduced to a single regiment organized in 1784. The surgeon's mate of this regiment was one Richard Allison a native of Pennsylvania and some time surgeon's mate of the 5th Pennsylvania regiment of Continental Infantry from March 15, 1778 to January 1, 1783, when he was transferred to the 1st Pennsylvania, in which he served to the close of the war. Of his early history the records say nothing. His military service was evidently satisfactory however, for in July 1788 we find him promoted to be surgeon of the 1st Infantry, becoming thereby the ranking medical officer of the forces. As the army was increased from time to time, he retained his seniority and when in 1792, it was reorganized and formed into a "Legion," he was appointed to the General Staff as chief medical officer with the style of "Surgeon to the Legion," with four surgeons of sub-legions and twelve surgeon's mates of battalions. The Legion was commanded by Major General Anthony Wayne and was employed largely in operations against the Indians of the then western country. In this body he served until honorably discharged on November 1, 1796. No portrait of Dr. Allison is known to have been in existence, nor, so far as can be ascertained is there any record of his career subsequent to his discharge.



**JAMES CRAIK.**  
**PHYSICIAN GENERAL OF THE UNITED STATES ARMY**  
**1798-1800.**

VI. JAMES CRAIK, PHYSICIAN GENERAL OF THE UNITED STATES ARMY, 1798-1800.

**A**RBIGLAND near Dumfries in Scotland, was a superb country seat situated on a headland of the North Sea. There in 1730 was born to its master a son, James Craik, who was destined to exercise an enormous, although unappreciated influence upon the future of a nation and the destiny of a continent. From this sturdy home young Craik fared forth to engage in the study of medicine at Edinburgh. History has naught to say of his life here and we next find him in 1750 emigrating to the new world and practicing medicine in one of the islands of the West Indies. Finding too limited a latitude for his powers there he drifted north and located in Virginia near Norfolk, where ample scope was afforded for his lancet and leeches, but the restlessness of youth lured him still further west and he again located at Winchester, where he saw his first military service in connection with the medical work of the Fort situated there.

Upon the organization of the Virginia Provincial Regiment in 1754, Craik was appointed surgeon. The command was at the same time tendered to Major George Washington who modestly declined but accepted the Lieutenant-Colonelcy, the command going to Colonel Joshua Fry. The regiment was not brought together until, upon the death of Fry at Wills Creek, Washington succeeded to the leadership and the headquarters joined him at Fort Necessity. Here was begun that lifelong intimacy between Washington and Craik which was of so much advantage to both. Craik, as medical officer of his regiment was present at the battle of Great Meadows and rendered surgical aid to the wounded in that action.

His service extended also over the period of the ill-fated expedition of Braddock toward Fort Duquesne and he participated in the battle of the Monongahela, where he dressed the wounds of the commander of the British forces and many others of the injured upon that bloody field. Here he witnessed the singular impunity which attended his youthful chief as he performed his duties first as aide and later as commander of the disheartened remnants of the British troops. This made a profound impres-

sion upon Craik, which was strongly emphasized when some years later he met an Indian chief who related to him the story of repeated efforts upon his own part and numerous attempts upon the part of his young braves to slay young Washington, but, always failing, they became imbued with the idea that he was under divine protection and ceased to fire upon him. Craik, with added respect for his friend and commander, accompanied the troops upon their memorable retreat to the east.

When, then, on the 14th of August, 1755, some six weeks after the operations on the Monongahela Washington was appointed to the command of the Virginia provincial army and assigned to the duty of protecting the Virginia and Maryland frontier from the French and Indians, Dr. Craik still remained as his chief medical officer. The operations thus begun continued for more than three years, during which all the hardships and privations of the hardy frontier troops were shared by the young surgeon, whose service ceased only upon the disbandment of the little army after the capture of Fort Pitt on the 25th of November, 1758.

Upon his retirement from the Virginia provincial service, Craik purchased an extensive plantation at Port Tobacco, in Charles County, Maryland, and erected upon it a spacious mansion which was described by his grandson, the Hon. Daniel Jenifer, in 1849 as even then one of the "largest, most comfortable and agreeable residences in the country." Hither on the 13th of November, 1760, he brought his young bride née Mariamne Ewell of "Belle-Air," in Prince William County, Va., and here he passed in active medical practice the years which elapsed until he again followed his friend at his country's call. During this time the Craiks and the Washingtons never relinquished their intimacy and the interchange of visits between Port Tobacco and Mount Vernon were the source of the sincerest pleasure to both.

In 1770 Craik accompanied his friend upon the first of two adventurous trips into the western wild to enable Washington to personally examine the lands there subject to military claims. Irving remarks that "the whole expedition was one of those hardy and adventurous kind, mingled with practical purposes in which he [Washington] delighted. This winter voyage

down the Ohio in a canoe with the Doctor for a companion and two Indians for a crew through regions yet insecure from the capricious hostility of prowling savages is not one of the least striking of his frontier experiences." They rode on horseback to Pittsburg and thence canoed down the Ohio as far as the Big Kanawha. It was on this trip that Craik met the old sachem who told him of the many ineffectual attempts upon the life of Washington at the battle of the Monongahela. Fourteen years later, after one had led and the other assisted in one of the most memorable conflicts in the world's history, they again toured over the Appalachian mountains and voyaged down the Ohio to the Monongahela which this time they ascended and then struck southward through the pathless forest until they emerged near Staunton in the Shenandoah Valley, having ridden nearly 700 miles about the towering peaks and through the rugged passes of the Alleghenies.

When the occurrences arose which culminated in the War for Independence, Dr. Craik was an active patriot. As early as 1774, he was conspicuous in a meeting of the citizens of his county at Port Tobacco, at which were adopted a series of resolutions in which the people pledged themselves that if the Act of Parliament to blockade the port of Boston was not promptly repealed, the inhabitants of the county would join with the several counties of Maryland and the principal colonies in America, to break off all commercial communication with Great Britain and the West Indies. Craik was a member of the committee of correspondence selected to carry out these resolutions.

So valuable to the cause was the presence of Craik in Maryland and so deeply were planted the rootlets of his social and professional relations, that Washington hesitated a considerable time after assuming command of the American forces to ask his old friend to again place his medico-military experience at the disposal of his country. But in April 1777 in a most cordial letter he tendered to him his choice between the positions of "Senior Physician and Surgeon of the Hospital with pay of four dollars and six rations per day and forage for one horse," and "Assistant Director General, with pay of three dollars and six rations per day and two horses and travelling expenses found" in the Middle Department. The latter position the Doctor accepted and soon entered

upon his duties. On the arrival of Count Rochambeau and his forces, Craik was ordered to join them at Newport, Rhode Island, and to organize their hospital department, a task which he accomplished with the most complete success, and from that time continued to be an active and efficient medical officer of the Army.

On the reorganization of the medical department, October 6, 1780, Dr. Craik was appointed the senior of the four "Chief Hospital Physicians and Surgeons," being the third officer in rank in the Medical Corps; and upon the resignation of Director General Shippen and the promotion of Dr. John Cochran, "Chief Physician and Surgeon of the Army," he was advanced to the second place under the latter title. This position he held until mustered out at the end of the War, in 1783, after personally participating in many of its most important events including the capitulation at Yorktown.

One of the most important acts of Dr. Craik during the War of the Revolution, was in connection with the exposure of the infamous Conway Cabal against General Washington. His letter of warning to his commander in chief on the subject is one of the most valuable historical documents of the period.

At the close of the War, he returned to his home at Port Tobacco, but shortly after, at the earnest solicitation of his late chief he removed to Alexandria near Mount Vernon, where he continued in agreeable association with the Washingtons until his death. In 1798 when war with France seemed inevitable and Washington was again summoned to lead the army, he made the appointment of Craik at the head of the medical department one of the conditions of his own acceptance of the command, remarking, "I have already been applied to by a gentleman, to recommend him for director of the hospital, which I have refused, as well on general grounds as because I should prefer my old friend Dr. Craik, who, from forty years' experience, is better qualified than a dozen of them together." Craik was accordingly commissioned Physician-General of the Army, July 19, 1798 with the pay and emoluments of Lieutenant-Colonel, but without rank. With the proverbial negligence of military legislation, the act organizing the provincial army provided only for regimental surgeons and surgeon's mates. Fortunately however Hon. James McHenry, the Secretary of War, had himself served as a medical officer during the Rev-



olution and in him Craik found a strong support in developing a properly organized "Medical Establishment," an act for the materialization of which was passed by Congress, March 2, 1799. The determined attitude of the United States, her prompt resort to arms and the reappearance of her illustrious soldier at the head of the army however, was sufficient to repress the warlike ardor of France, and, peace speedily prevailing between the two nations, the army was disbanded, Physician General Craik's service officially terminating on June 15, 1800.

Long before the latter date, however, he had returned to his beautiful Virginian home where on the 17th of December, 1799, it fell to his lot to close with his own hand the dying eyes of his faithful and famous friend, after the curious bit of malpractice involved in phlebotomy for the acute laryngitis with which Washington was suffering—a procedure quite in accord with the practice of the time but entirely unjustified today. For half a century their lives had run along parallel lines; their youthful commissions had been signed on the same day; side by side they had tempted the fortunes of war; their friendship was cemented by an intimacy of fifty years; and they were endeared to one another by common toils, privations and honors. Of that solemn hour, Craik himself wrote; "I, who was bred amid scenes of human calamity, who had so often witnessed death in its direst and most awful forms, believed that its terrors were too familiar to my eye to shake my fortitude; but when I saw this great man die, it seemed as if the bonds of my nature were rent asunder, and that the pillar of my country's happiness had fallen to the ground." Washington's own testimony to the relations between them was witnessed by the clause of his will which specified that: "To my compatriot in arms, and old and intimate friend, Dr. Craik, I give my bureau (or as the cabinet makers call it, tambour secretary) and the circular chair, an appendage of my study."

Dr. Craik survived this event fifteen years, the latter portion of the time in honored retirement, being remembered by his grandson at this period as "a stout, hale, cheery old man, perfectly erect, fond of company and of children, and amusing himself with light work in the garden." He remained vigorous to the last and passed away February 6, 1814, at the age of sixty-four.

BIBLIOGRAPHY OF THE OFFICERS OF THE ARMY  
MEDICAL DEPARTMENT.

THE librarian of the Army Medical Library is endeavoring to obtain as full as possible a collection of the professional contributions of medical officers of the United States Army. The project is a most commendable one and it is hoped that the Army medical officers will respond with entire unanimity to this effort. The Library desires all works written by Army medical officers, including,—

1. Books.
2. Pamphlets.
3. Reprints.
4. Journal Articles and clippings which have not been reprinted.

Nothing is too brief or too extensive to be included in the list. The titles will, with proper description, be inserted under the name of the author in the index catalogue, thereby facilitating the biographical records of military medicine. All such works may be forwarded to the Library under official frank, and labels for that purpose will, if desired, be furnished by the Library upon request.

## EXAMINATIONS FOR ARMY MEDICAL SERVICE.

THE examination of applicants for appointment as Assistant Surgeon in the United States Army will be resumed in Washington immediately after the close of the present session of the Army Medical School; it will embrace the full examination (as heretofore), at the conclusion of which those found qualified will be commissioned. Full information as to the requisite qualifications for appearance for examination, method of application, nature and scope of examination, etc., may be obtained upon application to the Surgeon General, U.S. Army, Washington, D.C. The examining board will probably reassemble about the middle of April next, and those desiring to present themselves before the board should make application at once. Applicants are restricted in age to thirty years, and one year's hospital experience or its equivalent in private practice is required.

## Reviews of Books.

### DEAVER'S SURGICAL ANATOMY.\*

**T**HE author, in his past experiences as an anatomist, as a teacher and as an operating surgeon of wide experience, early in his career, realized the need of a work that fully covered the field of surgical anatomy. His experience as a teacher of this subject in the foremost medical school of this country convinced him of the inadequacy of the then text-books on this subject. The years of work devoted to the production of these volumes is well known to the writer, who read some of the manuscript while a student of medicine. The trials of the author and tribulations of the publishers and the many delays are also a familiar story. Yet with all these obstacles the work has been successfully issued,—a classic on surgical anatomy, and a credit to the publisher.

The author in his text and in the preparation of his plates had in view the needs of the various branches of the profession in their every day work; hence it appeals to the student, the specialist and the busy practitioner as well as to the operating surgeon; while it is especially adapted to the use of the military or naval medical officer so often isolated from opportunities to refresh his memory upon the cadaver itself.

The plates made from dissections done under the personal supervision of the author and finished by able artists and engravers, introduce a new method of illustrating the human anatomy. To those who wish to renew their anatomical knowledge, or to freshen up for a particular operation these plates are in-

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**\*A Treatise on Human Anatomy in its Application to the Practice of Medicine and Surgery.** By JOHN B. DEAVER, M. D. In three Royal Octavo Volumes of more than 600 pages each, containing 499 full-page plates including 610 figures, nearly all from dissections made for the purpose. Philadelphia, P. Blakiston's Son & Co., 1903.

valuable. The accuracy of their detail delineation is unquestionable and can be relied upon at all times.

The anatomical conditions met with in every operation are fully described in the text. "Each part of the body is separately described and illustrated. The operation is taken up, the relations of muscles, nerves, arteries, etc. set forth so that the reader can go over any proposed operation with as much satisfaction as if a dissection was being made upon the cadaver."

The author and publishers are and rightfully should be proud of these three volumes regarded as they must needs be by the profession as a classical treatise on the subject.—A. R. ALLEN.

#### THE NEW INTERNATIONAL ENCYCLOPEDIA.\*

**A**N encyclopedia of American origin and execution, but covering an international field, is well worthy the consideration of every citizen of the United States. Such a work should have before it the highest ideals and should not fail fully to measure up to them. It should be clear, succinct, accurate and adequate in text and rich, handsome and attractive in mechanical construction. Careful scrutiny of the volumes of the New International Encyclopedia reveals a striking approximation to these qualities. The first glance notes a particularly clear typographical dress and a remarkable artistic value. In no other work of the kind has the pictorial element been employed so extensively and advantageously. The usual diagrams and explanatory illustrations are present, but in rather better style than has been seen hitherto; numerous full page plates, many in colors, add still more to the informative character of the work; while a large number of finely executed reproductions of famous works of art and a profusion of portraits are especially valuable features.

A careful examination of the text accentuates the impression derived from the first glance, and reveals a comprehensive and exhaustive plan, with its outlines intelligently and correctly filled

\**The New International Encyclopedia*. Editors: DANIEL COIT GILMAN, LL.D., HARRY THURSTON PECK, Ph.D., L.H.D., and FRANK MOORE COLBY, M.A. Vols. I-XIV; Imp. 8vo; pp. upwards of 1000 each, with numerous illustrations; New York, Dodd, Mead & Co., 1903.

in. The articles relating to art and artists are worthy of especial comment because of the thorough scholarship displayed in their preparation. The work in natural history too is of a notably high grade and well divested of the technicalities which disfigure the treatment of these subjects in so many other works.

Military matters receive full and accurate consideration and include articles on Military Architecture and the West Point Academy, Military Commissions and Military Courts, Military Government and Military Law, Military Police and Military Reservations, the various military orders and the Military Service Institution. Artillery, Cavalry and Infantry each receive detailed discussion, and the various military stations of the United States are located and briefly described. Arms and fortifications are each the subject of elaborate description, and the several military post-graduate schools are noted. Naval science is included in articles upon Navies and the Annapolis Academy, the Naval Institute and the Naval Observatory, Naval Reserve and Naval Schools of Instruction. Men of War and Cruisers, Armored Vessels and the minutiae of naval service are well and clearly discussed.

The medico-military features of the work are no less well worked out. The article on Ambulances is largely military in character. Military surgeons will find much of special interest in the article on Hospitals in which military hospitals are treated with especial fullness, while the army Hospital Corps and Hospital Ships each form the subject of separate articles. The Medical Department of the Army also forms the subject of a special article, a large portion of which however is devoted to the Army Medical School at Washington. The British army medical school at Netley receives the honor of a special article; doubtless a future edition will note the replacement of the Netley institution by the Medical Staff College in London. The Contract Surgeon is also recognized by a special article, in which he is discussed in companionship with the Contract Dental Surgeon. For further information the inquirer is referred to an article on the "Surgeon, Military" to appear in a subsequent volume, and which will doubtless well round out the consideration of the medico-military service.

While we have adverted especially to its treatment of military and naval subjects, its discussion of topics relating to other branches of knowledge is no less ample and accurate. It affords, in brief, a comprehensive and complete view of the sum of human information and stands firmly forth as a worthy exponent of American scholarship.

TRYPANOSOMA AND TRYPANOSOMIASIS WITH  
SPÉCIAL REFERENCE TO SURRA IN THE  
PHILIPPINE ISLANDS.\*

THIS valuable monograph is one of the most interesting of the products of the government laboratories of the Philippine Islands and embodies a full and exhaustive account of the interesting affection to which it is devoted. In addition to an extensive series of original investigations the authors have made a thorough examination of the literature of the subject as is shown by the many references to other authorities and by a complete bibliography appended. They conclude that the disease is of remote origin, records of it in some countries dating back for centuries. It is distributed over large areas of the tropical and subtropical world corresponding closely in its dissemination to the malarial zones. The life cycle of *Trypanosoma* is as yet unknown but is believed to be acted out entirely within the animal economy. Especial emphasis is placed upon the conveyance of the disease through wounded surfaces, in which biting insects, particularly flies and fleas, serve as the principal agencies. The prevalence of the disease is dependent upon the presence of a host for the *Trypanosoma* and of insects for their transmission. The hosts vary in different countries. In Manila sick horses exist in sufficient numbers to carry the infection from one rainy season to another. Cows and rats may also aid in its perpetuation. Serum therapy has hitherto been unsuccessful here but there seems to be some promise of success. All other methods for the treatment of the disease have been without results of practical importance or significance.

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\**Trypanosoma and Trypanosomiasis with Special Reference to Surra in the Philippine Islands.* By W. E. MUSGRAVE, M. D. and MOSES T. CLEGG. 8vo; pp. 248; with 155 illustrations. Manila, Bureau of Public Printing, 1903.

A SPANISH TRANSLATION OF SENN'S MEDICO-  
SURGICAL ASPECTS OF THE SPANISH-  
AMERICAN WAR.\*

THE fact of a translation of an American work upon the Medical Department of the Spanish-American War by a distinguished Spanish officer shows a breadth of view and a degree of genuine interest upon the Spanish side which is admirable. The compliment to the distinguished author of the book is also worthy of recognition by his American confreres. The work of Colonel Senn is itself so familiar to the members of the Association of Military Surgeons that it is not necessary to refer to it here. The translation is, as would be expected from Don Juan Redondo, in classic Castilian, preceded by a historical note containing a sketch of Colonel Senn, and followed by an interesting appendix comprising some additional information from the Spanish standpoint upon the subject of the work. Upon the whole this edition is a most valuable contribution to military medicine and surgery, and American military medicine may well extend to Don Juan Redondo its cordial thanks for his work upon it.

\**Guerra hispano-americana—estudio medico-quirurgico*, por el Dr. Nicolás Senn. Traducido del Inglés por Don JUAN REDONDO, premér medico de la Armada. Madrid, 1902.

WOODHULL'S MILITARY HYGIENE.\*

THE third edition of Colonel Woodhull's invaluable text book has about the same bulk as the first edition, but when it is noted that the first edition was interleaved with blank pages, it becomes evident that this edition is nearly twice as large as the original publication. As a matter of fact the first edition had 150 pages while the present contains 238. The additional matter is the logical result of the author's experience in the study and teaching of hygiene and of the progress of the affairs requiring recognition in the book. The text has

\**Notes on Military Hygiene for Officers of the Line*. By Colonel ALFRED A. WOODHULL, M. D., U. S. A. 3rd. Edition: 16mo; pp. viii, 238. New York, John Wiley & Sons, 1904.

been brought fully up to date and corresponds accurately with the present status of military organization. The most noteworthy development, however, is the chapter upon the Care of Troops in the Field, especially in Tropical Countries, which is an expansion of a brief chapter prepared for the second edition at the opening of the Spanish War and which is a most valuable remembrancer for the officer of the line. Another noteworthy feature of the book is a Scheme for a Sanitary Inspection by Company Officers, both in garrison and in the field, which may well be a guide for medical officers, also.

#### MEDICAL LIBRARY AND HISTORICAL JOURNAL.

THE *Medical Library and Historical Journal* has closed its first volume and fully justified the action of its projectors in inaugurating the experiment of the publication of a journal devoted to medical bibliography, history and biography. The work demonstrates that there is a distinct field for the publication of a periodical of the kind. The announcement for 1904 promises an improvement even upon the contents of 1903 and is accompanied by a most imposing list of contributors including many of the most prominent medical bibliophiles in the country.

#### THE GREATEST CAUSE OF ARMY INEFFICIENCY.\*

THE greatest cause of army inefficiency according to Mr. Profeit is venereal disease and the present little work is a free discussion of this subject. The remedy which the author suggests is a stringent application of the contagious diseases acts, making the propagation of such affections a penal offence. There is no question of the need for some intelligent action directed toward the control of the spread of venereal disability, but, while his comments upon the subject are of interest and value, it is doubtful if they touch the root of the matter.

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\**Army Inefficiency; its Greatest Cause.* By A. C. PROFEIT, M.B. 8vo; pp. 57. London, J. & A. Churchill; Philadelphia, P. Blakiston's Son & Co., 1903.



# Army Medical Reorganization.

## THE PROPOSED ARMY MEDICAL CORPS AND MEDICAL RESERVE CORPS.

THE Secretary of War laid before Congress a few days ago the following draft of a bill prepared by the Surgeon General, fundamentally reorganizing the army medical department, recommending its passage with the omission only of the limitations with regard to examination of lieutenant colonels.

The bill is admirable in providing for dropping the meaningless and misleading titles of assistant and deputy surgeon general, surgeon, and assistant surgeon, and replacing them by the simple titles of the corresponding grades in the medical corps. The extension of the feature of examination for promotion to officers of field rank is an innovation of much value and the reduction of the period of service as a first lieutenant from five to three years is in line with existing conditions.

Perhaps the most important feature however is the definite abandonment of the acting assistant or contract surgeons and their replacement by officers of a medical reserve corps, duly commissioned and endowed with all the rights and privileges of other commissioned officers of the army except that of retirement. This is a most admirable solution of the contract surgeon problem and will add enormously to the facility of military administration.

It is hardly necessary in this place to enlarge upon the great importance of this bill and the profound necessity for its passage but it is well worth while to quote the sagacious comment of Ex-Secretary Root that "it will be easy in time of war to secure an adequate number of physicians competent to treat the sick and wounded, but it will be impossible to secure medical men competent to conduct the administration of the great and complicated

medical service unless they are specially trained in time of peace. The lack of a sufficient number of such trained officers in the past has caused untold suffering and the sacrifice of many thousands of valuable lives. It is our present duty to see that such a condition shall never exist again."

To emphasize these facts and to remedy the evil to which they refer has been the chief mission of the Association of Military Surgeons of the United States, and for that reason as well as on many other accounts the progress indicated in the bill, which is appended, is most cordially welcomed.

BE IT ENACTED etc., That from and after the approval of this act the medical department of the United States army shall consist of one surgeon general, with the rank of brigadier general; a medical corps and a medical reserve corps, as hereinafter provided: and the hospital corps, the nurse corps and dental surgeons as now authorized by law.

**Composition of the Army Medical Department.** Sec. 2. That the medical corps shall consist of 16 colonels, 24 lieutenant colonels, 110 majors, and 300 captains and first lieutenants, who shall have rank, pay and allowances of officers of corresponding grades in the cavalry arm of the service. Immediately following the approval of this act all officers of the medical department then in active service, other than the surgeon general, shall be re-commissioned in the corresponding grades in the medical corps established by this act, in the order of their seniority and without loss of relative rank in the Army, as follows: Assistant surgeons general, with the rank of colonel, as colonels; deputy surgeons general, with the rank of lieutenant colonel, as lieutenant colonels; surgeons, with the rank of major, as majors; assistant surgeons who had attained the rank of captain on or before December 25, 1903, as captains; assistant surgeons, with the rank of first lieutenant who, at the time of the approval of this act, shall have served less than three years as such in the Regular Army, as first lieutenants: Provided, That assistant surgeons who at the time of the approval of this act shall have served three years or more in the Regular Army as such and who had not attained the rank of captain on or before December 25, 1903, shall, subject to examination, be re-commissioned in the medical corps in the order of their seniority, as captains, to rank as such from the date of the approval of this act: Provided, further, That any assistant surgeon with rank of first lieutenant who has heretofore failed to

qualify for promotion to the rank of captain and is now under suspension shall be recommissioned in the medical corps as first lieutenant with rank as such from date of his commission as assistant surgeon and shall, at the end of his period of suspension, be again examined in accordance with existing law, and if found qualified shall be commissioned in the medical corps as captain with the rank to which he would have been entitled under the terms of this section had he not been under suspension; if he fails to pass such examination he shall be honorably discharged from the service with one year's pay as provided by section 5 of this act.

Sec. 3. That promotions in the medical corps to fill vacancies in the several grades created or caused by this act, or hereafter occurring, shall be made according to seniority, but all such promotions and all appointments to the grade of first lieutenant in said corps shall be subject to examination as hereinafter provided: Provided, That the increase in grade of colonel, lieutenant colonel, and major provided for in this act, shall be filled by promotion each calendar year of not exceeding two lieutenant colonels to be colonel; three majors to be lieutenant colonels; 14 captains to be majors; and of the increase of the grade of first lieutenant not more than 25 per centum of the total of such increase shall be appointed in any one calendar year; Provided, further, That a first lieutenant of the medical corps upon the completion of three years' service, including service as assistant surgeon in the Regular Army, or as surgeon or assistant surgeon in the volunteer army during the war with Spain or since, or on active duty as first lieutenant in the medical reserve corps as hereinafter provided, shall be entitled to the pay and allowances of a captain of the medical corps, and when the aggregate of his service either as first lieutenant in the medical corps or as assistant surgeon in the Regular Army equals three years he shall be entitled subject to examination, to promotion to the grade of captain in the medical corps.

Sec. 4. That no person shall receive an appointment as first lieutenant in the medical corps until he shall have successfully passed an examination under regulations to be prescribed by the secretary of war, before an Army **Entrance Examination** medical board consisting of not less than three officers of the medical corps, to be designated by the secretary of war.

Sec. 5. That no officer of the medical corps shall be promoted therein until he shall have successfully passed an examination

before an army medical board consisting of not less than three officers of the medical corps to be designated by the secretary of war, such examination to be prescribed by the secretary of war and to be held at such time anterior to the accruing of the right to promotion as may be for the best interests of the service: Provided, That should any officer of the medical corps fail in his physical examination and be found incapacitated for service by reason of physical disability contracted in the line of duty he shall be retired with the rank to which his seniority entitled him to be promoted, but if he should be found disqualified for promotion for any other reason a second examination shall not be allowed, but the secretary of war shall appoint a board of review to consist of three medical officers superior in rank to the officer examined, none of whom shall have served as a member of the board which examined him. If the unfavorable finding of the examining board is approved by the board of review the officer reported disqualified for promotion shall, if a first lieutenant or captain, be honorably discharged from the service with one year's pay and, if a major or lieutenant colonel, shall be debarred from promotion and the officer next in rank found qualified shall be promoted to the vacancy. If the action of the examining board is disapproved by the board of review the officer shall be considered qualified and shall be promoted: Provided further, That the examination for promotion from the grade of lieutenant colonel to colonel shall be limited to an examination of the officer's physical condition, his moral character, and his past record in the service.

Sec. 6. That nothing in this act shall be construed to legislate out of the service any officer now in the medical department of the Army, nor to affect the relative rank for promotion of any medical officer now in the service or who may hereafter be appointed therein, as determined by the date of his appointment or commission.

Sec. 7. That for the purpose of securing a reserve corps of medical officers available for military service the President of the United States is authorized to issue commissions as first lieutenants therein to such graduates of reputable schools of medicine, citizens of the United States, as shall from time to time, upon examination to be prescribed by the secretary of war, be found physically, mentally, and morally qualified to hold such commissions, the persons so commissioned to constitute and be known as the medical reserve corps. The commissions so given shall confer upon the holders all the authority, rights and privileges of commissioned officers of the like grade in the medical corps of the United States Army, except promotion, but only when

**Examination  
for Promotion.**

**The Medical  
Reserve Corps.**

called into active duty as hereinafter provided and during the period of such active duty. Officers of the medical reserve corps shall have rank in said corps according to date of their commissions therein, and when employed on active duty as hereinafter provided shall rank next below all other officers of like grade in the United States Army: Provided, That contract surgeons now in the military service, who receive the favorable recommendation of the surgeon general of the Army, shall be eligible for appointment in said reserve corps without further examination.

Sec. 8. That in emergencies the secretary of war may order officers of the medical reserve corps to active duty in the service of the United States in such numbers as the public interests may require and may continue such officers on such duty so long as their services are necessary: Provided,

**Active Service of the  
Medical Reserve Corps.**

That nothing in this act shall be construed as authorizing an officer of the medical reserve corps to be ordered upon active duty as herein provided who is unwilling to accept such service, nor to prohibit an officer of the medical reserve corps not designated for active duty from serving with the militia, or with the volunteer troops of the United States, or in the service of the United States, in any other capacity; but when so serving with the militia or with volunteer troops or when employed in the service of the United States in any other capacity, an officer of the medical reserve corps shall not be subject to call for duty under the terms of this section: And provided further, That the President is authorized to honorably discharge from the medical reserve corps any officer thereof whose services are not longer required: And provided further, That officers of the medical reserve corps who apply for appointment in the medical corps of the Army may, upon the recommendation of the surgeon general, be placed on active duty by the secretary of war and ordered to the Army medical school for instruction and further examination to determine their fitness for commission in the medical corps.

Sec. 9. That officers of the medical reserve corps when called upon active duty in the service of the United States as provided in section 8 of this act shall be subject to the laws, regulations and orders for the government of the Regular Army, and during the period of such service shall be entitled

**Pay and Emolu-  
ments of the  
Medical Reserve  
Corps.**

to the pay and allowances of first lieutenants of the medical corps with increase for length of service now allowed by law, said increase to be computed only for time of active duty: Provided, That no officer of the medical reserve corps shall be entitled to retirement or retirement pay; nor shall

he be entitled to pension except for physical disability incurred while in active duty and in the line of duty.

Sec. 10. All acts and parts of acts in conflict with the provisions of this act are hereby repealed.

### THE INTERNATIONAL CONGRESS OF MILITARY SURGEONS.

THE international feature has always been a conspicuous characteristic of the meetings of the Association of Military Surgeons of the United States and it has had the pleasure of entertaining many distinguished officers of foreign services at its several conventions. It has been determined however to make the international aspect particularly prominent at the St. Louis meeting. To carry out this plan the kind offices of the Secretary of State and the authorities of the Louisiana Purchase Exposition have been placed at the disposal of the Association. The diplomatic representatives of the United States, at every national capital, have been instructed to request in the name of the American Government and the Universal Exposition, the detail of suitable delegates to the meeting. The superb Hall of Congresses of the Fair has been assigned for the use of the Association during the sessions of the Congress, and a hotel upon the exposition grounds and under the direct control of the exposition management has been secured for the social headquarters. In every respect then, the Thirteenth Annual Meeting—to convene at the World's Fair, St. Louis, October 10th to 15th, 1904,—promises to be a complete success both as the regular yearly convention of the Association of Military Surgeons of the United States for 1904 and as an International Congress of Military Surgeons.





**Executive Building of the Fort Stanton Sanatorium.**  
(Post Exchange under Army Regime.)

## FURTHER OBSERVATIONS ON THE TREATMENT OF TUBERCULOSIS AT FORT STANTON, NEW MEXICO.

BY PAUL M. CARRINGTON, M.D.,  
SURGEON IN THE UNITED STATES PUBLIC HEALTH AND MARINE-  
HOSPITAL SERVICE.

### **Introductory.**

**I**N a former article, presented to the American Medical Association at its meeting in Saratoga in June, 1902, I gave some account of the work done at Fort Stanton, including statistics from November 1899, when the station was first opened by Passed Assistant Surgeon J. O. Cobb, to and including April 30, 1902. The great professional and public interest in the question of climatic Sanatorium treatment of tuberculosis, rather than the ability to present anything absolutely new, must be my excuse for this article. My former article has led to many requests from citizens generally for admission to the Fort Stanton Sanatorium, they not being aware that the beneficiaries of the Sanatorium are restricted to seamen employed on the Merchant Marine vessels of the United States, officers and men of the Revenue Cutter Service, keepers and crews of light house establishments, and seamen employed on vessels of some other branches of the public service, other than the Navy.



**United States Marine Hospital Sanatorium for Tuberculosis at Fort Stanton, New Mexico.**  
(General View with beef cattle in the foreground)



**Descriptive.**

As Fort Stanton was at one time a military post and as the Association of Military Surgeons contains a large number of Medical Officers of the Army, a brief history of the station will doubtless be of interest.

Fort Stanton is situated on the right bank of the Rio Bonito, a mountain stream, having its source in the White Mountains, about 18 miles distant; it is 10 miles from Lincoln, the county

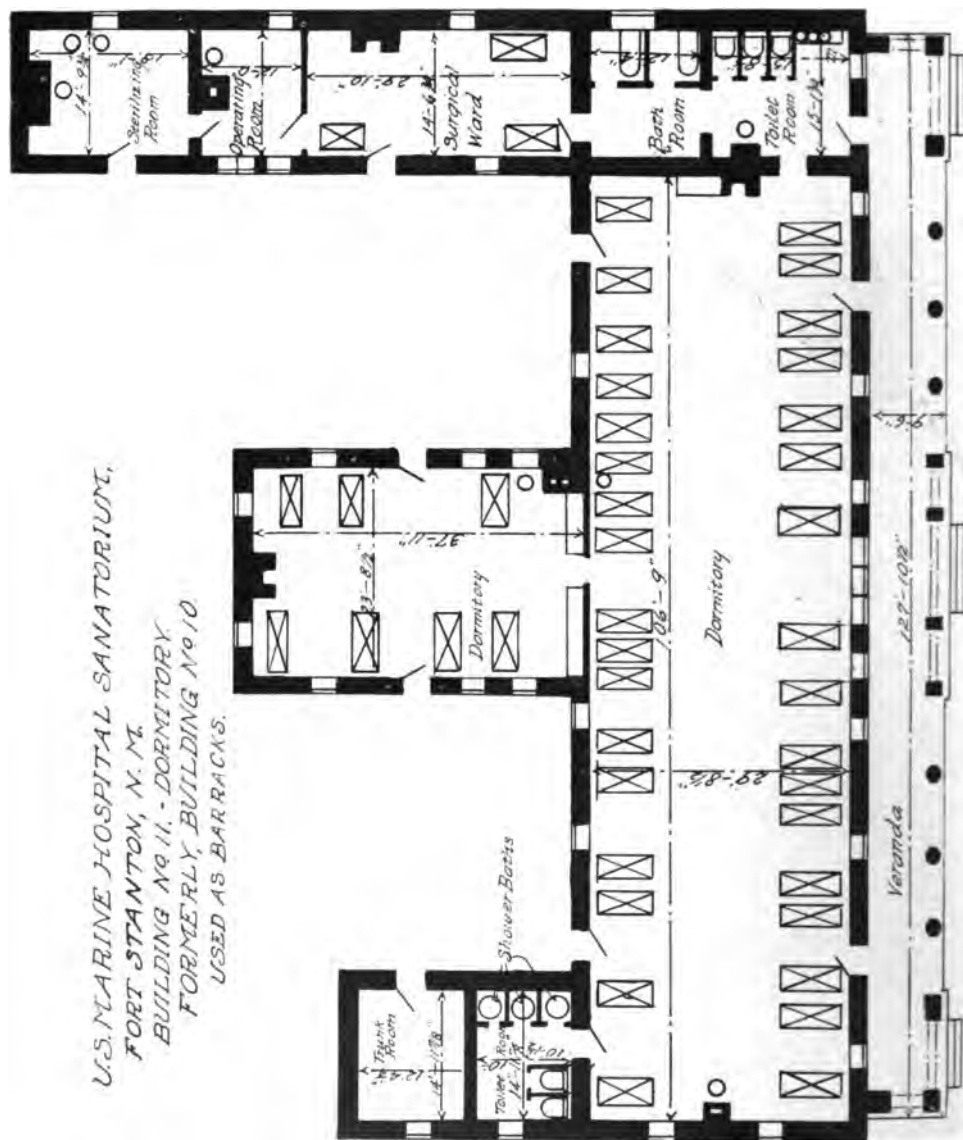


**Residence of Medical Officer in Command.**  
(Double Set of Officer's Quarters under Army Regime)

seat of Lincoln county, and 8 miles from Capitan, the nearest railroad point, and terminus of the El Paso and Northeastern Railway. Mail is received every day except Sunday.

Fort Stanton was established in 1855 to control the Mesquero and White Mountain Apaches. The post was burned and abandoned in 1861 by the United States troops upon the approach of the Texas troops under General Sibley. In the spring of 1863, after the defeat and withdrawal of the Confederates, a garrison of

U.S. MARINE HOSPITAL SANATORIUM,  
FORT STANTON, N. M.  
BUILDING No 11. - DORMITORY  
FORMERLY BUILDING No 10  
USED AS BARRACKS.



volunteers re-occupied the post, and by covering the old walls with rafters and earth roofs made the quarters tenatable. In this condition the post was occupied until 1868, when repairs and reconstruction were commenced. Substantial stone barracks, quar-



**Dormitory.**  
(Barracks under Army Regime)

ters, offices and store houses for the accommodation of four companies were erected from 1868 to 1871, or adapted from the old buildings whose walls had been left standing.

The land is very fertile and all crops raised in a temperate



**Quarters for Convalescent Patients.**  
(Bachelor Officers' Quarters under Army Regime)

climate can be produced in abundance, when sufficient water for irrigating purposes can be obtained. The gardens at this place supply all necessary vegetables, except potatoes. We have an alfalfa field of 63 acres which supplies the demands of the Station.

Owing to the large amount of snow which fell in the mountains last winter, we are planting all available lands and hope to raise enough forage to supply our needs for the coming year.

The original reservation embraced 144 square miles or was 12 miles square, but under authority of the Act of Congress of May 21, 1872, 128 square miles were transferred to the Interior Department and thrown open to settlement under the general land laws. A tract embracing 16 square miles, 8 miles in length and 2 miles in width along the Rio Bonito, was retained for military purposes. In August, 1896 the post was abandoned, all troops withdrawn and the reservation was turned



**Main Dining Hall and Kitchen.**  
(Barracks under Army Regime.)

over to the Interior Department. The Reservation was then transferred to the Marine Hospital Service, and was formally accepted from the Interior Department on April 27th, 1899, by Passed Assistant Surgeon J. O. Cobb, who had been detailed for that purpose. On November 1st, 1899, the reservation was extended one mile on the north and one and three quarter miles on the south, and now contains 38 square miles, nearly all under fence.

Since the transfer of this reservation from the Interior Department, the Marine Hospital Service has been constantly at work repairing and altering the buildings, beautifying the grounds and making the place one of the finest Sanatoria in the United States.

During the Army regime the water was supplied from a deep well by steam pump to a tank and then distributed by pipe to the Post. The well and tank were constructed in 1885 at a cost of \$5,000.00. The capacity of the tank is 40,000 gallons. This was found to be insufficient for the needs of the Sanatorium and soon after the occupancy of the Station the Service constructed a large reservoir, capacity 1,000,000 gallons, which is supplied by a ditch three miles long leading from the Rio Bonito. The old Army well and tank are used as a reserve for the dry summer season.



**Interior of Main Dining Hall.**

To the south of the Post is the old Army cemetery. In this cemetery was buried a young son of the late Major General Henry W. Lawton, who was at the time of his service here a captain. The body of this child has evidently been removed, but the partially crated grave stone is still to be seen in the cemetery.

About two miles below Fort Stanton, near the Rio Bonito, is what is known as the "Lincoln County Cave." This cave has

never been entirely explored. The soldiers stationed at Fort Stanton attempted at one time to explore it, and after spending seven days in the cave, reported that there were streams, which could not be crossed without the means of a boat, hence their explorations were confined to only one portion of it. Some portions of this cave are very pretty and stalactites abound. It is told by old settlers that the soldiers pressed a bunch of Indians very closely and that to escape they took refuge in this cave. As there was no known second opening the soldiers thought to starve the Indians out, but they were seen several weeks afterwards on the other side of the Capitan Mountains, 30 or 40 miles from this



**Residence of Passed Assistant Surgeon.**  
(Commanding Officer's Quarters under Army Regime)

opening. It is evident that the Indians knew of a second opening, but it is still unknown to white men.

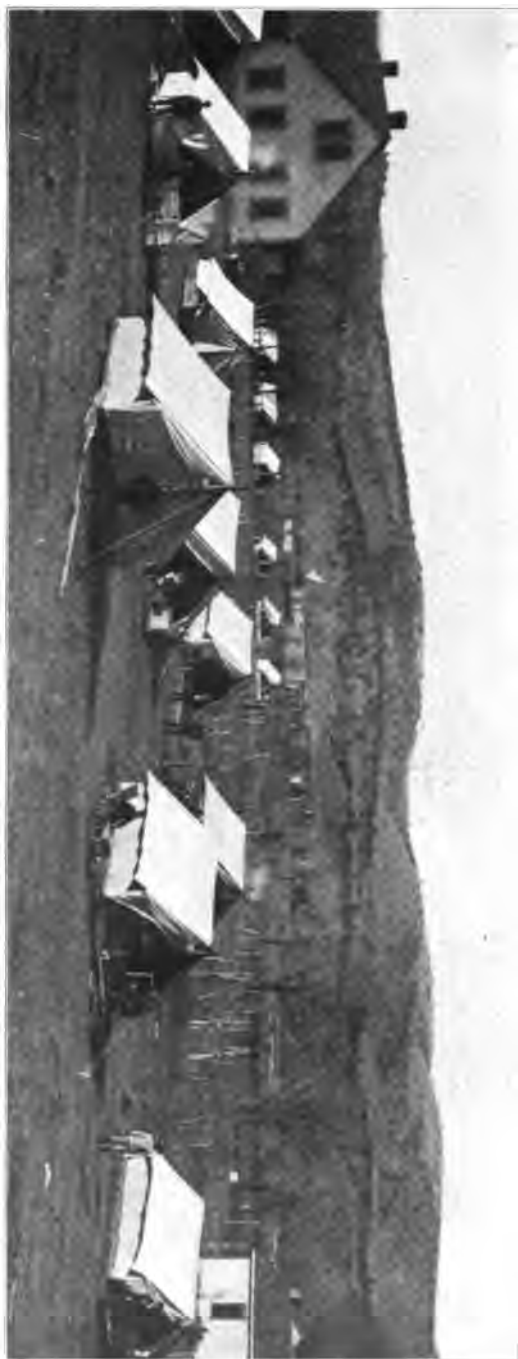
I know at least one medical officer of the army who has pleasant recollections of Fort Stanton, since he spent his courting days here, and several are remembered most kindly and often spoken of in the highest terms by citizens residing in the vicinity.

#### **Climate.**

The climate is characterized by extreme dryness, a large proportion of sunshiny days, and great purity of the atmosphere. While there is frequently wide daily range of temperature, owing largely to the altitude, which is 6150 feet, the winters may be

said to be warm and the summers cool. The weather observer's records for the past three years show the following averages: highest temperature 98.7 lowest 2, mean 53.6. The low temperature records occur invariably at night, while the customary daylight temperature even in the very cold weather is usually high enough to permit comfortable living out of doors. In the year 1902 there were 279 clear days, 53 partly cloudy days, and 33 cloudy days; this number of cloudy days being in excess of the previous two years. The precipitation, a considerable portion of which is snow during the winter, varies from 14 to 17 inches. In a climate of this character,

General View of Tents.



naturally, living out of doors is possible almost every day in the year, and even on days when the temperature is highest the heat is neither oppressive or debilitating. The atmosphere seems to be free from pathogenic germs and wounds of all kinds heal very kindly, and without infection even with the most careless disregard of asepsis.



**Tent, Showing Ventilation by Openings on Three Sides.**

In this connection it is an interesting fact that on the appearance of winter our mixed infection cases invariably lose their mixed character, and since November last the bacteri-



**Tent with Munson's System of Ventilation.**

ologist has not reported a single case of mixed infection except on the first examination after the arrival of patients. The rarefaction of the atmosphere makes deeper breathing necessary and our records show a

diminished liability to hemorrhages, due doubtless to the decreased barometric pressure.



**Character of Cases Admitted.**

We receive cases in all stages and in all periods of development, as well as with many if not all the various complications to which consumptives are subject. During the year ended April 30, 1903, we have treated 282 cases, of whom only 39 or about 15 per cent were of the first stage. These facts must be borne in mind in any consideration of our statistics and results.



**Tent No. 18 in Winter.**

The classification followed is the division of cases into the first stage, in which the disease has not progressed to consolida-



**Interior View of Tent No. 18.**

tion, which may be detected by physical signs; and second and third stage cases, in which the physical signs reveal consolida-

tion with or without excavation. I have grouped these two latter stages together because of the easy transition from the second to the third stage, and the difficulty, and frequently the impossibility, of detecting by physical signs just when excavation begins.

#### **Buildings.**

The buildings at this Sanatorium are those usually found at an army post and are constructed of stone and adobe, and arranged on four sides of a square, known as the "Parade Ground." We have converted the parade ground into a blue



**Tent with sides raised for Ventilation.**

grass lawn, which affords quite a pleasing contrast to the brown of the surrounding hills. All of the old buildings have either been altered and repaired, or are in process. The old barracks buildings have been converted into dormitories, and the single officer's quarters are used as sleeping apartments for the convalescent cases. Photographs of some of the reconstructed buildings are offered for your inspection, and I think you will agree with me that they make manifest the good taste and ability of our architect, Mr. J. Ross Thomas., who is himself a third stage consumptive.

**Tents vs. Houses.**

I have been a persistent advocate of the tent as a dwelling for consumptives since early in my tour of duty at Fort Stanton. I found considerable unwillingness to try the experiment at first, and began with two or three tents pitched among the trees surrounding the old Army hospital, but the tent idea increased in popularity by patients being impressed by the degree of improvement made by the pioneers, and now I have more than 30 tents in use, quartering more than 50 patients. I am not supplied with the Munson tents, but am now putting up the ordinary tents



**Tent occupied by Consumptive Medical Officer.**

which I have, with elevated flues so as to obtain the ridge ventilation which is the distinctive feature of Capt. Munson's tent. Another idea of ventilation is shown in photograph of tent No. 18, and still others are ventilated by means of fore and aft windows. My tents are all floored, sided, and provided with small sheet iron stoves, and notwithstanding the fact that we have experienced during the past winter the lowest temperature which has been known in this region for many years, I have had every tent occupied during the entire winter. In the past 18 months



Tent Life in Winter.

more than 100 cases have been quartered in tents, and almost without exception these cases have shown decided improvement, and some of them have been discharged recovered. Cases in all stages have been quartered in tents, and only in a few instances has it been found necessary to remove a patient from the tents into the buildings.

#### **Prevention of Infection.**

It is naturally a matter of extreme importance to prevent the Sanatorium from becoming infected and thus becoming a focus for the dissemination of tuberculo-

sis among the natives, or healthy employes, or by the re-infection of cured patients. With this object in view strong anti-spitting regulations are enforced, all sputum being deposited in pocket and bed-side cups provided for the purpose. All metal cups with their contents are disinfected daily by superheated steam in a sterilizer specially constructed for the purpose. Paper bed-side cups are used very largely and these are destroyed by fire. We continue to use metal pocket spit cups, as the most satisfactory cup thus far devised. Periodical disinfection of all apartments occupied by consumptives is practiced, and recent experiments of Passed Assistant Surgeon E. K. Sprague in charge of the Laboratory, by the injection of dust and scrapings taken from various rooms in the hospital where our worst cases are quartered, into guinea pigs, shows this building to be free from infection.



**Sputum Sterilizer.**

These experiments prove conclusively that if the building is infected by "spraying," the method of disinfection by bichloride sponging is efficient.

Experiments are now in progress to determine whether or not formaldehyde gas will destroy bacilli in masses of sputa in an ordinary living room.

**Daily Routine.**

The medical staff consists, when the complement is full, of one Surgeon, as Commanding Officer, two other commissioned officers and two acting assistant surgeons. The junior officers serve successively as "Officers of the Day," their tour of duty being 24 hours. It is the duty of the officer of the day to make daily inspection of all dormitories, toilet rooms, etc., and report their condition to the Commanding Officer; he answers emergency calls and receives and gives attention to newly arrived pa-



**Interior of Laboratory.**

tients. Two officers are assigned in charge of the physical examination room, and all patients are not only examined upon arrival, but the examination is repeated every two months. One officer has charge of the bacteriological laboratory, and one of the nose and throat clinic, a portion of our work which offers a varied and interesting field.

I usually make the morning sick call and endeavor to make it an occasion of interest as well as profit, and believe it serves to

relieve to some extent the tedium of the forenoon, especially for the ambulant cases, who find time hanging rather heavily on their hands. In fine weather the men are assembled on the parade ground under the charge of a drill master, who puts them in formation for "setting up" exercises. I then take them in charge and put them through simple breathing exercises for about 15 minutes, after which by passing up and down the lines sick call is made. They are then turned over to the drill master and dismissed. The Hospital sick call then follows. By this means the morning sick call is made some thing of a function and occupies a considerable portion of the forenoon.

*Ambulant Cases taking Breathing Exercises prior to Morning Sick Call.*



The breathing exercise is of undoubted value and invariably increases the chest expansion.

#### **Dietary.**

The dietary is ample in quantity and first class in quality, and as varied as our market will permit. We produce our own milk, although unfortunately the supply is not as great as it should be. The number of patients has increased so rapidly that our dairy has been unable to keep pace, so that at present we have only three pints of milk per diem per man. Malted milk is used largely, as are clam juice and beef extracts.

We necessarily produce our own garden truck, as it would be otherwise impossible to secure fresh vegetables. We grow with perfect success the usual garden products of the east, including very fine watermelons and canteloupes. Our tables are not only supplied during the season with all sorts of vegetables, but we store for winter use large quantities of vegetables such as cabbages, carrots, parsnips, turnips, onions, etc.

#### **Rest and Exercise.**

I wish to emphasize the importance of the proper adjustment of the proportion of rest and exercise for consumptives. More than enough rest is far better than too little and too much exercise is always disastrous. Even the best cases should take their exercise with proper caution, and especially is this true for newly arrived cases. We find it constantly necessary to preach the doctrine of rest, as the tendency is to over exercise. Many consumptives come to neighboring villages and ranches without means, but with the idea of supporting themselves by various employments, to which fact is doubtless due the failure of many to realize the hoped-for benefits from the climate. Dr. Edwards of Coronado, California, writes: "It is madness to come to California in search of health without ample means to supply all the comforts and luxuries." This remark may apply equally to New Mexico.

#### **Amusements.**

Here we are unfortunately very weak. Our patients come from three classes: the deep sea sailor, the lake sailor, and the river men, and form a heterogenous mass with individuals of



almost every nationality on earth and naturally with different tastes, experiences and aspirations. As is well known, sailors, who are subject to strict discipline while on board ship, give themselves every license while on shore. A large proportion have been addicted to excessive drinking and other forms of dissipation for years; for such sanatorium discipline becomes very irksome, and they become easy victims to the allurements of the villages eight and ten miles distant where the saloons dispense bad whiskey on all days and at all hours. However opinions may differ as to the use of alcoholics medicinally in the treatment of tuberculosis, there can be no question of the ill effects of the excessive use of alcohol, and especially of the kind of liquor dispensed by the country saloons of this territory. Recovery from tuberculosis is a serious undertaking requiring patience and self restraint, and I may say some hardships, for a period which must be measured more frequently by years than by months. The consumptive must give up many amusements, which he formerly regarded as necessary to his happiness, and must live a life of regularity and temperance. He must have an earnest desire to get well, and be willing to deny himself those things which are harmful, and cheerfully comply with all the regulations of the Sanatorium of which he is an inmate, believing that such regulations are made for his good. We have patients who are avowedly indifferent to the result; such patients not only do not improve, but their example discourages others. They had better have remained in the seaports, where they would not discourage others, who really wish to recover, but for the fact that by their transfer here, they cease to be disseminators of infection. Our observation is that the more intelligent, cheerful and obedient the patient, the better his chances for improvement or recovery. For the interest of our patients we have a library, and various harmless games are encouraged. We have a golf course, although comparatively few sailors take advantage of this excellent form of amusement and exercise. Religious exercises are held twice each week, and occasional concerts relieve to some extent the monotony of life. A few extremely good cases are allowed horseback exercise. The fence rider and cow boy, who has charge of our beef cattle has

now two volunteer assistants, (patients), whom I have provided with horses, which they themselves groom, feed and ride daily.

All things considered our patients are well behaved, and our discipline is good. Comparatively few yield to the temptations of the saloon, and many are to be commended for the self-control exercised. The evil effects of over indulgence in liquor are not usually apparent for some days, or even weeks, afterwards, so it is hard to convince those who will drink despite advice and rules that the "back set" is due to this cause, and now and then it becomes necessary to discharge a patient for intemperance.

It is a serious matter to cast a consumptive adrift without money or friends so far from home and it is with great reluctance, and only when absolutely necessary for the maintenance of discipline that I resort to this extreme measure. My patients know this and naturally some take advantage of the fact. It is to be regretted that we are not legally authorized to administer adequate punishments without being compelled to dismiss refractory patients.

It is also desirable that we be authorized to retain those patients who, tiring of the restraints of the Sanatorium life, wish to leave before being fully recovered; many such leave against advice and are discharged improved, who might have been sent away cured had they exercised more patience and perseverance.

#### Statistics.

Year ended April 30, 1903.

Cases under treatment at beginning of year.....	115
Cases admitted during the year.....	167
Total.....	282

The tables given below show the following results, eliminating the cases under treatment less than one month:

For the year ended April 30, 1903.

Died.....	29.-%
Unimproved.....	7.2%
Improved.....	52.4%
Apparently recovered.....	11.3%

## *TREATMENT OF TUBERCULOSIS AT FORT STANTON. 227*

The consolidated statistics for the entire period since the opening of the Sanatorium until April, 30, 1903, computed on the same basis give the following results :

Died.....	24.9%
Unimproved.....	2.8%
Improved.....	54.2%
Apparently recovered.....	18.1%

These statistics deal only with the cases in which treatment has terminated.

It will be observed that our statistics do not show as good results during the last year as we have previously obtained. This is due mainly to the fact that the character of the cases admitted during the past year has undergone a proportionate change for the worse ; whereas during the former period we received 20% of first stage cases, and 80% of second and third, during the past year we have received but 15% of first stage cases and 85% of second and third, of whom the far advanced cases form a much larger proportion, than during the former period. There are also now under treatment several recovered cases, who are about ready to be discharged, but who do not figure in these statistics, for the reason that they are still officially borne on the rolls as being under treatment. There continues to be a difficulty in retaining patients under treatment for a sufficient length of time, and during the year I have seen case after case leave the Sanatorium in a condition just short of complete recovery. When advised to remain these patients say; "Why I feel as well as I ever did in my life," and they cannot be made to understand that it is not a matter purely of sensation.

The importance of early diagnosis and treatment is shown by the following results by stages: of the first stage cases 50% have recovered, 37.5% were discharged improved; whereas of the second and third stage cases 5.6% recovered, 54% were discharged improved, 7.3% were discharged not improved and 33% died.

## RESULT:

	SERIES 1 The 115 patients under treatment April 30, 1902	SERIES 2 The 167 patients admitted between Apr. 30, '02 and Apr. 30, '03
Died.....	16	28
Discharged unimproved.....	4	7
Discharged improved.....	39	26
Discharged apparently cured	10	4
Still under treatment.....	46	102
	<hr/> 115	<hr/> 167

## AGES WERE AS FOLLOWS:

Under 25 years.....	15	18
From 25 to 34 years.....	44	65
From 35 years to 44 years.....	34	53
From 45 to 54 years.....	16	24
Cases 55 years and older.....	6	8
	<hr/> 115	<hr/> 167

	SERIES 1	SERIES 2
History of tuberculosis in parents.....	7 cases-6%	29 cases-17.4%
Both lungs affected.....	84 cases	155 cases
One lung involved.....	31 cases	12 cases
Tubercle bacilli demonstrated in sputum...	110 cases	147 cases
Pulmonary hemorrhage occurred.....	53 cases	60 cases
Hemorrhage before but not after admission.	24 cases	48 cases
Hemorrhage after but not before admission.	6 cases	3 cases
Hemorrhage both before and after admission	23 cases	9 cases

Of the 134 cases who died or were discharged during the year, 10 cases were under treatment less than one month, and all were in Series 2. Of these 8 died and 2 were discharged unimproved.

## COMPLICATIONS.

	SERIES 1	SERIES 2	TOTAL
Larynx Involved.....	3	14	17
Syphilis.....	15	13	28
Meningitis.....	1	1	2
Testicles involved.....	2	1	3
Fistula in Ano.....	2	3	5
Nephritis.....	6	1	7
Heart disease (organic) in 11 cases.			
Pericarditis in one case.			

Pneumo-thorax is the most fatal of all complications, and no amount of forethought and care seems sufficient to prevent its occurrence; it occurring sometimes in cases, which have been making steady improvement. One of our cases occurred in a patient who had gained 25 pounds in weight, and who seemingly had every prospect of continued improvement and ultimate recovery. Our pneumo-thorax cases have been universally fatal, with the exception of one case, which occurred about four weeks

# TREATMENT OF TUBERCULOSIS AT FORT STANTON. 229

ago, and which is still under treatment, but even this case is expected to terminate fatally within a short time. Further allusion to this complication will not be made as a member of the staff will present the subject in a separate paper.\*

## CLASSIFICATION—FIRST STAGE.

	SERIES 1	SERIES 2	TOTAL
Cases treated .....	14	25	39
Results:			
Died .....		1	1
Discharged unimproved .....		2	2
Discharged improved .....	2	4	6
Discharged apparently cured .....	5	3	8
Still under treatment .....	7	15	22
	14	25	39

In the fatal case death was due to softening of brain.

	SERIES 1	SERIES 2	TOTAL
But one lung involved .....	9 cases	7 cases	16
Both lungs involved .....	5 cases	18 cases	23
Tubercle bacilli were found in sputa ..	11 cases	17 cases	28

In 54.5% of cases where tubercle bacilli were not found there was history of syphilis. Hemorrhage occurred in six cases of this class. Of the 17 cases of this class, in which treatment has terminated (discarding the brain case), the results are:

	SERIES 1	SERIES 2	TOTAL	%
Improved .....	2	4	6	37.5
Not improved .....		2	2	12.5
Apparently cured .....	5	3	8	50

The average gain in weight for the two months between October 1st, 1902 and December 1st, 1902, was 4.6 pounds.

New patients average for the first two months after arrival a gain of 4.26 lbs.

These figures include all cases except a few not in a condition to be put on the scales.

SECOND AND THIRD STAGES.	SERIES 1	SERIES 2	TOTAL
No. treated.....	101 cases	142 cases	243
Tuberculosis in parents.....	7 "	24 "	31
Both lungs involved.....	79 "	127 "	216
But one lung involved.....	22 "	5 "	27
Tubercle bacilli not found.....	2 "	12 "	14
Larynx involved.....	3 "	14 "	17
Syphilis occurred.....	10 "	7 "	17
Results of treatment were:			
Died.....	16	27	43
Discharged unimproved.....	4	5	9
Discharged improved.....	36	22	58
Discharged apparently cured.....	6	1	7
Still under treatment.....	39	87	126

\*Asst. Surg. J. W. Trask: *Jour. Am. Med. Asso.*

Of the 27 fatal cases in Series 2, seven were under treatment less than one month, and one case discharged not improved was also under treatment less than one month, and of the seven cases one arrived with a pyopneumo-thorax of some duration, one had a severe hemorrhage on the train, and one had organic heart disease.

Pulmonary hemorrhage exclusive of streaked sputum occurred in 107 cases as follows :

	SERIES 1	SERIES 2	TOTAL
Before but not after admission.....	23	47	70
Before and after admission.....	21	8	29
After but not before admission.....	6	2	8
	<hr/> 50	<hr/> 57	<hr/> 107

Of the 117 cases in which treatment has terminated :

Died.....	43 cases or 37. %
Not improved.....	9 cases or 7.7 %
Improved.....	58 cases or 50. %
Apparently cured.....	7 cases or 6. %

Eliminating the seven fatal cases and one case discharged not improved, which were under treatment less than one month, the percentages are :

Died.....	36 cases or 33. %
Not improved.....	8 cases or 7.3 %
Improved.....	58 cases or 53. %
Apparently cured.....	7 cases or 6.4 %

General summary of all cases treated from the opening of the Sanatorium to April 30, 1903:

	OLD SERIES	NEW SERIES	TOTAL	%
Treated.....	303	167	470	
Died.....	45	44	89	19.
Discharged not improved....	9	11	20	4.
Discharged improved.....	97	64	161	34.
Apparently cured.....	38	14	52	11.
Still under treatment.....		148	148	31.5

CASES DIED, DISCHARGED AND RESULT:

Died and discharged.....	322	
Died.....	89	27.6 %
Discharged not improved.....	20	2.8 %
Discharged improved.....	161	50. %
Discharged apparently cured.....	52	16. %

Eliminating the 27 cases of the former series and the 10 cases of the present series under treatment less than one month, the results are :

## STATISTICAL HISTORY SHEET—Tuberculosis.

UNITED STATES PUBLIC HEALTH AND MARINE HOSPITAL SERVICE SANATORIUM, FORT STANTON, NEW MEXICO.

Name, <i>Nandus Anderson</i>	: Race, <i>White</i>	: Sex, <i>Male</i>	: Age, <i>26</i>	: Date of examination, <i>July 12, 1900</i>
Family history (tubercular): <i>No</i>	: P, <i>No</i>	: B, <i>No</i>	: W, <i>171</i>	: Build, <i>No</i>
Personal history: <i>Diagnosed tubercular. Patient seems heavy cold due to exposure.</i>				
: Condition of teeth, <i>Fair</i>				
: Respirations per minute, <i>16-18</i>				
: Pulse, <i>80-90</i>				
: Weight, <i>160</i>				
: Height, <i>5' 10"</i>				
: Urine, <i>Normal</i>				
: Stool, <i>Normal</i>				
: Sputum, <i>None</i>				
: Blood, <i>Normal</i>				
: Skin, <i>Normal</i>				
: Hair, <i>Normal</i>				
: Nails, <i>Normal</i>				
: Bones, <i>Normal</i>				
: Muscles, <i>Normal</i>				
: Nerves, <i>Normal</i>				
: Senses, <i>Normal</i>				
: Intelligence, <i>Normal</i>				
: Character, <i>Normal</i>				
: Habits, <i>Normal</i>				
: Occupation, <i>Normal</i>				
: Social history, <i>Normal</i>				
: Family history, <i>Normal</i>				
: Personal history, <i>Normal</i>				
: Physical examination, <i>Normal</i>				
: Chemical examination, <i>Normal</i>				
: Bacteriological examination, <i>Normal</i>				
: Radiological examination, <i>Normal</i>				
: Pathological examination, <i>Normal</i>				
: Therapeutic examination, <i>Normal</i>				
: Prognosis, <i>Normal</i>				
: Treatment, <i>Normal</i>				
: Results, <i>Normal</i>				
: Length of stay, <i>Normal</i>				
: Discharge, <i>Normal</i>				
: Follow-up, <i>Normal</i>				
: Remarks, <i>Normal</i>				

Diagnosis of patient. *Secured*Result of treatment. *Secured*Length of stay. *1 year, 6 months, 20 days*

Reduced Face Smile of Statistical History Sheet.—Overtone.

## PHYSICAL EXAMINATION.

Chest measurement: At rest 35 in. expiration 30

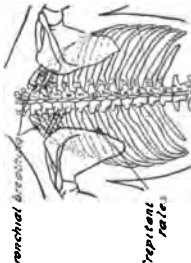
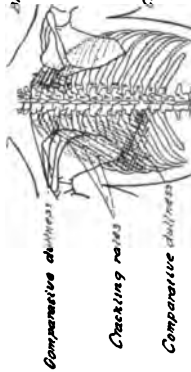
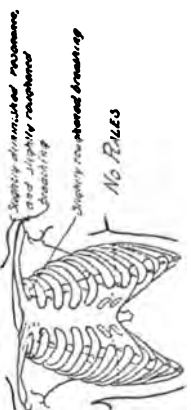
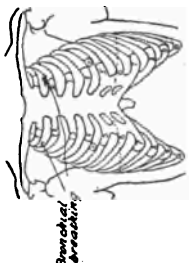
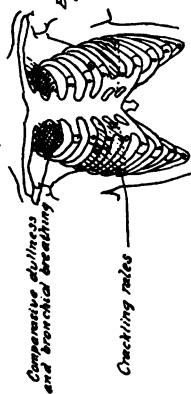
Percussion. Dullness in left apex and base and in right apex and infrascapular region.

Auscultation. Right lung tubular breathing in infrascapular space and crackling rales anteriorly from middle to base. Left lung has crackling in middle throughout except anteriorly between second rib and base.

July 12, 1909

Sept. 27, 1909

April 6, 1910



REMARKS: First stage—typical rale, bronchial breathing, etc., to be marked  
Second stage—consolidation, tubular breathing, etc., to be marked  
Third stage—crepitant, sputum breathing, etc., to be marked

Reduced Fac Simile of Statistical History Sheet—Reverse.



## TREATMENT OF TUBERCULOSIS AT FORT STANTON. 233

Died.....	71	24.9%
Discharged not improved.....	8	2.8%
Discharged improved.....	154	54.2%
Discharged apparently cured.....	52	18.1%
Total died and discharged.....	285	
One of the above deaths was due to sarcoma.		

### Treatment.

The treatment aside from air, food and rest is entirely symptomatic. There are less than 50 days in the year on which patients can not be out of doors at least half of the day. Commodious verandas have been constructed on all dormitory buildings, and the out-door life made as attractive as possible. I adopt the term "dormitory," by the way, instead of ward in order to emphasize the fact that the buildings are only places in which to sleep. All porches are provided with reclining and rocking chairs, and except in the severest winter weather hammocks are slung in the shady places beneath the trees. At night free ventilation of all sleeping apartments is enforced both winter and summer. As already stated a considerable portion of my patients are quartered in tents, which are ventilated in various methods as illustrated by the photographs which I hand you. It was anticipated that we would be compelled to remove our patients from the tents into houses upon the advent of winter, but the patients were so well satisfied in tents, and applications for admission were so far in excess of our house accommodations, that notwithstanding the remarkable severity of the winter, the tents have been continuously occupied, and will continue to be a permanent and prominent feature of this Sanatorium. The tents are pitched within easy access to toilet and bath rooms and our tent dwellers were comfortable in the most extreme weather.

As to rest and exercise the conditions mentioned in my former article hold good. Briefly they should vary from absolute rest in the febrile and far advanced cases to considerable exercise for the practically recovered case. They should be regulated according to the extent of involvement. I endeavor to prescribe appropriate rest and exercise according to the indications in the individual case. Indiscriminate exercise should never be allowed, and I am satisfied that the advice to "go west and rough it in a ranch" has been responsible for many fatalities which under judicious management might have been recoveries. I personally

know a number of persons now engaged in various pursuits in this locality who 10, 15 or 20 years ago came to this section suffering from tuberculosis; some of them so feeble that they had to be carried on stretchers. These persons are now, but for scar tissue in their lungs, in perfect health. These cases are so numerous and so well authenticated as to leave no doubt in my mind of the value of this climate in the treatment of tuberculosis, and my appreciation of the value of the climate is doubtless enhanced by the fact that I myself have been cured during my tour of duty at Fort Stanton; and that without the use of other remedies than ample food, and out door life.

I am indebted to Assistant Surgeon J. W. Trask of the sanatorium Medical Staff for valuable assistance in the preparation of statistics included in this article.

#### SUBSISTENCE DURING SIEGE.

THE problems connected with the food supply of besieged places (Dr. D. Angel de Larra y Cerezo, in a communication to the XIV International Medical Congress, Madrid, 1903,) are sufficiently intricate to require study, and should be worked out in time of peace so that solutions may be ready at hand in case of need. In order that places liable to siege may be enabled to hold out for the longest possible time it is necessary that certain preparations be made in time of peace which cannot be made after siege is actually begun. For example, such places should be provided with some means of getting a sufficient water supply from the sub-soil, such as steam pumps or artesian wells, and with means of storage especially adapted to the preservation of subsistence supplies in large quantities for long periods of time. The storage of meat in refrigerating rooms is far preferable to keeping on hand live animals. Available forage can then be devoted to the horses and mules; there will be no chance of losing the meat through disease; and space will be economized. Subsistence store-rooms should be in places where they will be least liable to injury from fire or by the enemy's shells, but at the same time they must be free from dampness. They should be numerous and scattered, so that no large proportion of the subsistence stores could be destroyed by a single shell. Horse flesh is satisfactory as food in an emergency.—C. N. BARNEY.

# TREATMENT OF FRACTURES OF THE BASE OF THE SKULL AND SOME REMARKS CONCERNING THE METHOD OF OPERATING.

BY CAPTAIN ROBERT EDDY BELL,

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COMMANDANT OF THE AMBULANCE CORPS OF THE MASSACHSETTS VOLUNTEER MILITIA; SURGEON TO ST. JOHN HOSPITAL AND TO THE LOWELL GENERAL HOSPITAL.

I AM somewhat appalled at the task of attempting to say anything new upon this subject. Not that our knowledge concerning fractures of the base is perfect, but so much thought has been given the subject during the last eight or nine years by men whose experience has been great along these lines that I fear anything I may say will be of but little interest.

Fractures involving the floor of the anterior and middle fossa and the pyogenic diseases of the brain in these regions resulting from infection have been, and are attracting, the earnest attention of our surgeons. Unlike the surgery of the abdominal cavity where the technique and indications for operative procedure are about perfect, much yet remains to be said and done concerning the surgery of the base of the skull.

In 1883 a very famous neurologist stated that it was useless to attempt to operate on the brain for abscess. One of the most eminent surgeons in London declared not twenty years ago, that a man would not see a case of abscess of the brain once in a lifetime. The condition of the surgery of fractures involving the floor of the fossae was in the same uncertain condition. I do not expect that anything I may say will interest the specialists in cerebral surgery, or the aural surgeon trained to deal with the numerous pyogenic infections of the brain. I will endeavor to report briefly a few cases which possess some points of interest to us as general surgeons.

The military surgeon must be prepared to meet and combat alone all kinds of injuries and diseased conditions. Unlike his confreres in the larger cities, he may not have an opportunity to call in the surgeon trained along some special line. He is somewhat in the position of the underrated country practitioner, who must face, and face alone, all sorts of difficulties. In discussing these few cases I will not weary you with anatomical points or symptoms, and the various theories of the significance of these symptoms, as the most recent works on anatomy and surgery go into these points most thoroughly. What I will give you is my own individual experience.

I do not aim to startle the surgical world with any new theories or methods. I do hope, however, by giving a brief report of five or six cases that have come under my observation, to hear from some of the other men present, their views on this subject.

Case No. 1, while it did not probably involve the floor of the anterior fossa, had some of the symptoms, so I speak of it.

This man was struck by a heavy derrick falling and hitting him on the head. The derrick was a very large one used in lifting stone. When I saw him about one hour after the injury he was unconscious, but could be aroused somewhat by attempting to touch the depressed bone. Pupils reacted, although sluggish; reflexes not abolished. There was a compound depressed fracture along the course of the superior longitudinal sinus, a piece of bone about three inches long being driven into the sinus. Upon removing the bone there was of course a tremendous flow of blood, for which I had prepared myself by having at hand a strip of gauze about three yards long and one inch wide, which I crowded into the sinus, layer upon layer, until the flow stopped. At the end of a week I began to gently coax out the gauze. At the end of two weeks it was all out and the patient went home. There have been none of the later mental derangements. The points of interest to me in this case are:

First. This man received the hardest blow, and yet made the most speedy and complete recovery. He has not developed any of the mental disturbances that have darkened the lives of some of the others. Dirt, sand and hair were driven into the

wound, yet by thorough cleansing and shaving before attempting to elevate the depressed portion, there was not the slightest evidence of suppuration. By using gauze enough and persistently crowding it into the sinus, there was not the least difficulty in stopping the flow of blood. I do not think that most of the text books are quite clear enough on this point.

We are told that we may attempt to ligate or use strips of gauze. I think most men would have had rather a serious time in ligating here with a stream of blood rushing out like a small river. The method of using several strips of gauze I do not like. I well remember seeing a surgeon in one of the large clinics of New York attempting to stop the flow of blood from the lateral sinus which he had unexpectedly opened by using the chisel and large mallet to do a mastoid operation. One rather short piece of gauze would be pushed in and the blood somewhat arrested, but by the time he had picked up another piece and adjusted it the stream would be as large as before. By the time he had finished, he had taken a large number of pieces of gauze and forty minutes of time. The point I wish to make is, that it is better to take one piece of gauze, until you stop the hemorrhage. I waited a week before I attempted to remove this gauze and then removed only as much as would come out easily. It was two weeks before it was all out. There was never the slightest trouble from hemorrhage.

Case No. 2. The second case was probably one of fracture through the anterior fossa. Of course we all recognize difficulties of diagnosing fractures of the base. Dr. Cheever says: "Fractures of the base are difficult to diagnosticate because we cannot see anything, cannot trace anything, cannot feel anything. The injury is where we cannot trace our fractured bone or be guided by ordinary signs, and can only infer and reason from the symptoms."

This boy was kicked by a horse; there was sharp hemorrhage from the nose, also hemorrhage into the conjunctiva. His head and face were covered with blood and sand; was unconscious and remained so for about six hours, after which he could be aroused; he remained more or less dazed for twenty-four hours, breathing

stertorous; pupils dilated and very sluggish; respiration 16. Dirt and hair were ground into the wound. The crack was directly over the situation of the frontal sinus. I thought it best to enlarge this crack and investigate. I found the sinus filled with brain tissue and blood clot. I thoroughly cleansed the sinus and drained, but not as in empyema of the sinus through the nose, for it seems to me rather better in these cases to let the inside of the nostrils pretty well alone. If we attempt to cleanse and spray I fear we may add to the danger of infection. Although there was no depression of bone in this case, I think by not waiting for symptoms pointing to some pyogenic infection and then opening the sinus, but by opening it up at once I may have saved this boy some trouble. At any rate, he made a very quick and uninterrupted recovery, but about six months after he began to show some signs of moral depravity, which took the form of lying, and stealing from his parents.

A number of articles have recently appeared concerning the later condition of these patients. In many cases where the recovery after head injuries has been apparently perfect, there has been developed later some impairment of general cerebral function.

Case No. 3. In the third case involving the middle fossa the man fell a distance of eight or ten feet striking upon the left side of his head and face. There was blood in the mouth and throat. He was pulling on a bale of goods: which falling upon him, of course caused him to strike with much more force. Pulse was 90; pupils unequal, right somewhat dilated. Pupils reacted very slightly. Found some brain tissue in left ear; some blood in nose and throat. There was an escape of cerebro spinal fluid and brain tissue from the ear. Of course, we know that blood and the escape of fluid from the ear are not the sure signs of fracture of the middle fossa, but a discharge of cerebro spinal fluid for some little time together with other symptoms is a pretty sure sign that we have a fracture through the petrous portion of the temporal bone. We know that blood may come from the ear if the tympanic membrane be ruptured, or if there be tearing of the soft parts of the tympanic cavity, or if the skin of the external

auditory canal be torn. Also blood may come from the fracture of the tympanic plate of the external auditory canal which forms the posterior wall of the articulating fossa of the jaw. In both cases where the fracture seemed to involve the middle fossa I commenced as though I were going to do a regular mastoid operation, only I laid bare a larger surface of bone than I would ordinarily have done for this operation alone, making a flap as recommended by Dr. Dench.

My reason for not simply trephining through the thin plate of the temporal bone and thus reaching the floor of the middle fossa was that these fractures are apparently along the upper surface of the petrous portion of the temporal bone through the roof of the tympanum and the osseous part of the external auditory canal, and as Dr. Barr states, most of these cases will have developed later purulent process of the middle ear. I think it better to do the mastoid operation at once taking away the roof of the tympanum which gives us direct drainage as we reach the most dependent part of the floor of the middle fossa. One may, of course, use the trephine to reach the floor of the middle fossa, but I prefer doing it as I have suggested. I found a clot of blood and broken down cerebral tissue along the floor of the fossa. I removed this blood and broken down tissue very carefully and drained with narrow wicks of sterile gauze.

This man made a good recovery, but has since developed some peculiar traits; he cannot be called insane, but he is certainly eccentric. He is able, and does work, every day.

Case No. 4. Case four, a boy fell from the roof of a house striking his head. I saw him about two hours after; he was unconscious, breathing stertorous, respiration 16, pupils unequal and did not react alike; right pupil dilated, left contracted, reflexes abolished; hemorrhage from the ear, blood very light in color, evidently mixed with cerebro spinal fluid; nose and mouth show signs of hemorrhages; pulse 86. A depression was found over the left parietal; there was no laceration of the scalp. The patient could not be aroused. Upon incising the scalp I found a fracture extending from the left parietal region down to the tip of the mastoid, the upper portion of the fracture depressed.

On investigating the fracture in the mastoid region I found it extended along the course of the sigmoid sinus. I proceeded as in the previous case, and found the sinus had not been injured, but the antrum and floor of the middle flossa filled with blood clots, which I removed and drained as before. All of the clots and debris were thoroughly washed out with hot saline solution and drainage established below the floor of the middle flossa. May 4th, two days after operation, patient very restless and irritable, but can be aroused so that he answers to his name and tells his age. Temperature  $99\frac{5}{10}$ ; pulse 108; respiration 30. May 5th, dressing saturated with the same pinkish looking fluid. Temperature 98; respiration 25; pulse 96. May 6th, patient still unconscious. Can be aroused. Flow of fluid from the left ear much less. May 7th, patient semi-conscious. Answers questions intelligently. Temperature 99; pulse 72. May 8th, patient conscious. Wishes to sit up in bed. Temperature  $98\frac{1}{2}$ ; pulse 72; respiration 22.

In operating on the skull and especially in the region of the mastoid, most of the text books recommend the mallet, chisel, trephine and burr. Sir William Macewen recommends the gouge and burr, but condemns the chisel and mallet most emphatically. In my operations in this region, which, (it is true,) number only about 50 on the living subjects, I have never used anything but the gouge; I have yet to strike the first blow with the mallet in doing the mastoid operation. With a short, stout gouge or chisel, with an expansion on the handle that rests against the palm of the hand, one may go through the hardest mastoid without difficulty, and without danger of wounding the sigmoid sinus or the delicate structures inclosed in the cavities; by simply shaving off the bone and looking, after each piece is detached, you can lay bare the wall of the lateral sinus without any danger of wounding the sinus. I do not use the burr, yet this instrument, as recommended by Sir William Macewen of Glasgow must be of great assistance. Although the directions for reaching the mastoid antrum with the trephine are very carefully figured out in most of the text books, I think the men who have done much operating in this region will agree that the distance between the lateral sinus and the bony wall of the meatus varies greatly, as also does



the depth both of the sinus and antrum from the outer wall. I do not like the mallet because it cannot do the already congested brain any good to receive the number of successive jars that must result from its repeated blows. Mr. Herbert Page says in the *Lancet* of January, 1901, that he believes that even concussion of any severity causes microscopic injuries to the cerebral matter which may lead to impaired mental and physical condition later. The safe area is here greatly restricted and we may easily drive the chisel into some of the danger zones. Of course in a majority of instances the mallet and chisel in the hands of a careful and competent operator will do good work; but there are instances where much harm has resulted from the accidental wounding of the brain or sigmoid sinus. We are all familiar with the fact that if an innumerable number of successive blows of even a moderate amount of force be produced upon a nerve filament, or along its course, the nerve or tissues to which that nerve is distributed, becomes numb. Formerly following the lead of European surgeons, most of our surgeons considered that all operations of the skull should be done rapidly in order to lessen the great mortality. Dr. Powell, who has done a great amount of work along these lines says, "I do not see why the skull cavity cannot be invaded with as little danger as the abdominal cavity, provided the contents of that cavity were protected from injury." In other words, it occurred to him that the mortality must be attributed to the method of operating, and not to the length of time occupied. In these cases of fracture of the base the patient has but a narrow margin, this margin being so narrow it might be possible for us to cause just a little more traumatism no matter how delicate our blows might be. This objection to the use of the chisel and mallet applies more forcibly when we operate for some of the septic conditions which are so apt to follow as a result of fracture of the base where communication has been established with the cavities of the nose and ear. In these cases there must be congestion of the cerebral tissues, and any additional jarring must be injurious. In looking up the treatment of the fractures of the base I find that most works on Surgery are disposed to advise us to treat them symptomatically. One of the recent

text books states that the treatment of the fractures of the base is symptomatic. As one of the principal dangers of such fractures is infection from the ear and nose, the ear should be thoroughly wiped out with moist cotton, and the part examined with the speculum. No irrigation should be employed because of the possibility of carrying infection into the fissures. The canal should be carefully stuffed with iodoform gauze or sterilized cotton. The nose should be cleansed by a spray and with moist cotton. Punctured fractures of the orbit must be thoroughly explored, the soft parts being incised and the orbital ridge trephined of a necessity, to gain access to the base of the brain.

Dennis' System of Surgery says: "So far as the treatment of basal fractures is concerned it differs but little from that already mentioned for fractures of the vertex. The principal addition to be made refers mainly to the endeavors to preserve an antiseptic, or if possible, an aseptic condition of those cavities into which cerebro spinal fluid is escaping."

I do not think these fractures of the base, especially those of the middle fossa, where we have an escape of brain tissue from the meatus together with cerebro spinal fluid or of cerebro spinal fluid alone should be treated symptomatically. I think all of these cases should be operated upon, either by trephining through the thin plate of the temporal bone and thus gaining access to the floor of the middle fossa and removing the blood clots and brain tissue and establishing drainage or by operating, as I prefer, by opening the mastoid region, taking away the roof of the tympanum, going into the mastoid antrum, then washing thoroughly from within, out, so that the possibility of carrying any infection by attempting to cleanse the ear through the external canal is avoided. The effect of quantities of hot saline solution upon the cerebral tissue is beneficial in restoring the activity of the respiratory system. Mr. Horsley says that in cerebral compression death is due to respiratory failure. In making some experiments with monkeys, hot irrigations with a temperature of from 100 to 105 were very beneficial in restoring activity of the respiratory centre. The day of ice bags in grave injuries to the skull is past.

In these serious injuries where apparently there is a fracture

along the floor of the anterior or middle fossa we give the patient the best chance of recovery if we operate. During my earlier hospital experience these cases were allowed to go without interference; practically all the works on surgery admit that the prognosis is grave, but do not give the student much encouragement or definite instruction about operating. It is true many of these cases recover without operation, but more of them die. It is also true that some apparently hopeless cases of abdominal lesion occasionally surprise us by recovering without operation, but that does not deter us from operating. While we cannot perhaps draw many conclusions from this small number of cases I have reported, I have certainly received sufficient encouragement to cause me to go along on these same lines.

It would seem to me that in all these cases of fracture unless we have some rather positive indications that we will hasten death by interference that we should resort to artificial respiration, open up the skull, determining by the symptoms as well as we can the seat of the lesion, stop hemorrhage, remove all blood clots, establish drainage and irrigate with plenty of hot saline solution.

I cannot persuade myself that we do the best for these patients when we put them to bed with an ice cap, treat them symptomatically and wait long for something to turn up. In most cases something will turn up, but it will be the spirit of our patient on the other side of the divide.

#### NOTE ON FILIPINO TREATMENT OF FEVER.

**F**ILIPINOS in general have very peculiar ideas of fevers. They usually roll a fever-patient in blankets and shut him up in a close hot room, because they believe that if a current of cool air should strike him, he would die instantly; a cold bath for a fever patient is considered little less than murder. For fevers in some parts of the Islands, the natives use the bark of a tree known as the andarayon; they claim that when it is made into an infusion it is superior to quinine. I cannot affirm or deny this statement because I have never seen the drug used.—MELVILLE A. HAYS.

## A PLEA FOR EARLY RADICAL TREATMENT IN ADENITIS INGUINALIS.

BY RICHARD LIGHTBURN SUTTON, M. D.,  
ASSISTANT SURGEON IN THE UNITED STATES NAVY.

THERE are certain pathological conditions encountered in the practice of surgery, which, by their constant repetition and seeming triviality, are usually regarded by the general surgeon as small but annoying and unavoidable evils accompanying, and oftentimes complicating, some general or localized trouble.

In no class of cases, probably, are these met with more frequently than in the obstinate, painful enlargements which we so often find following infection by the gonococcus, or occurring as sequelae of chancroidal lesions.

It is not my intention, in this brief article, to take up the bubo in its entirety. I desire only to call attention, as the following examples demonstrate, to the certain, speedy result which may be obtained by the early and complete removal of the affected tissues, as compared with the long-drawn-out "don't incise till you get fluctuation" treatment which is so frequently advocated.

Formerly, in private and dispensary practice, I tried the majority of the remedial agents usually prescribed, from the early and frequent application of ice-bags to Churchill's Tincture and the actual cautery, in persevering and painstaking, but almost invariably useless, attempts to get resolution.

Hypodermic injections of carbolic acid, formaldehyde, tincture of iodine, iodoform emulsion, and various other solutions and preparations were used with variable degrees of success.

The patient often made such strenuous objections to the deep insertion of the needle that the performances, even to an enthusiastic young surgeon with an investigative turn of mind, were far from enjoyable. And the results were even less satisfactory.

Patient.	Initial enlargement.	Suppuration.	Date of operation.	Character of Operation.	Result.	Date.
J. S.	Feb. 20.	Yes.	Mar. 23.	Extirpation and curettement.	Healing by granulation.	Apr. 30.
H. S. W.	Mar. 21 (?)	Beginning.	Apr. 7.	Extirpation.	Primary union.	Apr. 13.
C. S.	Mar. 22.	Yes.	Apr. 7.	Extirpation and curettement.	Healing by granulation.	May 8.
C. S.	Mar. 19.	Yes.	Apr. 7.	Extirpation and curettement.	Healing by granulation.	May 9.
A. W. H.	Mar. 24.	No.	Apr. 13.	Extirpation.	Primary union.	Apr. 20.
J. B.	Mar. 27.	No.	Apr. 14.	Extirpation.	Primary union.	Apr. 21.
H. O.	Apr. 1.	No.	Apr. 21.	Extirpation.	Primary union.	Apr. 29.
T. S.	Mar. 26.	No.	Apr. 23.	Extirpation.	Primary union.	Apr. 30.
T. K. D.	Apr. 20.	No.	Apr. 29.	Extirpation.	Primary union.	May 7.
T. K. D.	Apr. 23.	No.	Apr. 29.	Extirpation.	Primary union.	May 7.

During the past few weeks I have had an opportunity to compare the results secured by early glandular removal and those following the employment of abortive or prophylactic measures, as well as to note the time lost in those instances where the glands were allowed to break down before an incision was made.

The foregoing brief synopsis of ten cases operated on at the U. S. Naval Hospital, Washington, D. C., will serve, at least partially, to bring out the point in question.

(In referring to the foregoing data those patients held from seven to eight days were then discharged as fit to perform any and all duty.)

No one realizes better than myself that this table does not give a sufficiently large number of cases to fully demonstrate the excellent results which may be obtained by early operative interference. But it is enough to show the superiority of this mode of treatment in the saving of time, pain, labor and discomfort to both patient and surgeon as compared with the course of events under the ordinary expectant management.

The dressings employed where pus was present were of plain sterile gauze, the first layer applied loosely over the wound and securely covered in with aseptic pads, cotton and a spica bandage of the groin.

Daily irrigations of hot, saturated solution of boracic acid were used, and gauze packing and drainage instituted from the first.

Where suppuration had not occurred the wound was repeatedly washed with hot, sterile water, then closed with either interrupted silk-worm gut sutures or by the method known as the "sub-cuticular stitch," and a simple sterile pad applied for a day or so until it was positively ascertained that no suppuration was to take place. Then an iodoform collodion covering was substituted and the patient allowed to get up. In no case was there infection from external sources.

With regard to the operation itself care must be exercised in order that the large vessels, lying in close proximity as they pass into the femoral canal, may be protected from injury.

In some patients the abdominal walls are extremely thin and if the thickened and nodular glandular enlargements extend well down in the neighborhood of Poupart's ligament they had best be removed only by means of a blunt dissector and the operator's fingers.

In fact this also holds good with regard to all of the affected tissues.

If, after the primary incision is made through the superficial integument, the enlarged and adherent glands are firmly grasped by means of a volsellum, the knife discarded, and the mass freed entirely by the use of some blunt pointed instrument and the fingers, accidental puncture or tearing of important structures will be avoided.

In recommending the extirpation method I refer, of course, only to those glandular enlargements due to infection by the gonococcus or following chancroidal ulceration elsewhere.

If the adenitis is of specific origin a differential diagnosis can usually be made and the indurated masses readily undergo resolution under the influence of mercury and the iodides, administered in gradually increasing doses until the characteristic effect is produced.

A general anaesthetic (ether in nine instances, choloform in one) was used in all of the foregoing cases,—cocaine hydrochlorate, Schliech's solution and other local agents which were tried, all proving too uncertain as compared with the great advantages and uniform safety of general anaesthesia.

In reference to Naval practice the immense saving of time, as opposed to the consequent crowding of the Sick Bay from the accumulation of such cases as would occur under the expectant plan of treatment, should be an inducement for the prompt performance of this slight operation, so certainly followed by good results and leaving no cicatrized masses to break down and cause trouble later.

## SOME EXPERIMENTS WITH THE TRYPANOSOMA EVANSI.

By LIEUTENANT EDWIN D. KILBOURNE,  
ASSISTANT SURGEON IN THE UNITED STATES ARMY.

**D**URING the last three months an epidemic of surra has occurred in this neighborhood,—Calamba, Laguna, P. I. Many horses, both American and native, and many mules have perished. Some experiments made by the writer may be of interest.

A healthy young goat was injected with sterile trypanosoma taken from a horse, afflicted with surra. After several injections a small portion of the goat-serum was mixed with surra blood and found to have marked proteolytic properties, causing disintegration of the trypanosoma.

To get the trypanosoma in pure culture, I first tried to grow them on coagulated horse-serum, but was not successful. Novy and McNeal have recently reported that they were able to grow the *Trypanosoma Lewisii*, from rats, in the water of condensation, which formed below a coagulated mixture of rabbits' blood and agar-agar.

After several failures, I tried another method. As I could not grow the trypanosoma, my next idea was to separate them from the blood-corpuscles and concentrate them. This was done as follows:

Blood from a horse, suffering with surra, was drawn into a sterile flask. It was then defibrinated and allowed to stand. At the end of three or four hours the greater part of the corpuscles had settled to the bottom of the flask, leaving the trypanosoma and some of the corpuscles in the serum above. Because of their motility, the organisms do not fall with the corpuscles, but remain in the supernatant serum.

This serum was pipetted off. To get rid of the corpuscles



it still contained, an equal volume of goat-serum, possessing hemolytic properties for horse blood, was added.

The latter serum was prepared in the usual way, by giving a goat repeated injections of normal defibrinated horse blood. Normal goat-serum possesses slightly the property of dissolving the corpuscles of horse blood, so very few injections were necessary to make it strongly hemolytic. The hemolytic serum dissolved all the remaining corpuscles, and left only the trypanosoma in the mixture.

By centrifugation the organisms were collected in one end of the tube, and when the supernatant liquid was drawn off there was left a large mass of trypanosoma in a very small amount of serum.

This method might be employed also in separating out malaria organisms from human blood. A serum, hemolytic for man, could be added to malarial blood and everything but the malaria organisms dissolved. The serum containing the plasmodia could then be centrifuged and the latter obtained for experimentation.

The trypanosoma, thus collected, were used for injecting a goat, after the addition of a small amount of trikresol to kill the organisms.

A goat was given four injections of 5, 4, 6 and 5 c.c. respectively. Its serum was then mixed with an equal amount of defibrinated blood, drawn from a surra horse. Arrested motility with final disintegration of the trypanosoma occurred.

Their total destruction occurred in about four hours. Control tests were made with mixtures of defibrinated surra blood and normal goat-serum, in which no destruction of the trypanosoma resulted. In these control tests the organisms lived from two and a half to three days, which is about the time they live in defibrinated horse blood alone, outside the body.

These experiments show plainly that a dissolving amboceptor is produced, and give rise to the hope that preventive inoculations may be made in this, as yet, incurable disease.

Lingard in 1901 stated that he had succeeded in obtaining an immunizing serum, but did not state how it was obtained. He

had difficulty in preserving its destructive power for any length of time.

I was unable to determine how long the goat-serum possessed proteolytic properties because the epidemic in this neighborhood ceased, and no more organisms could be obtained.

Some experiments in the Tsetse-fly disease or Nagana are of interest, as this disease is closely related to surra. Kanthack, Durham and Blandford tried to produce immunity in several animals by inoculations with the serum from Nagana, without success. They reported that the serum contained no toxins. In their experiments the trypanosoma were removed from the serum.

The results from inoculations with bactericidal sera in other diseases have not been entirely successful, because of the short period of immunity conferred, but the experiments of Besredka and of Marie, following the method of the former, seem to show that immunity for a considerable time may be conferred.

The experiments I made show that the *Trypanosoma Evansi* can be isolated in sufficient numbers for experimentation and that a trypanosomicidal serum can be obtained.

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#### HYPERALGESIC ZONES IN GUNSHOT WOUNDS OF THE HEAD.

IN four cases of gunshot wounds of the head a zone of hyperalgesia was observed by Wilms without however disturbance of sensibility. The author was assured of the central origin of the condition, the pain being symmetrical and of equal intensity. The upper limits of the hyperalgesic zone corresponded with the boundary of the central zone of the fifth nerve the extent however not corresponding with the distribution of any peripheral nerve. The form of the zone indicated a lesion of a segment of the spinal cord and the condition was doubtless due to a lesion of the sympathetic in the neighborhood of the cavernous sinus. Thence the irritation was conveyed along the sympathetic to the communicating segment of the cervical spinal cord where it affected the sensory centres of pain, being referred to the zone of skin corresponding to the affected segment of the cord.

## MILITARY HOSPITALS AND NURSING.

By MAJOR MATT R. ROOT,

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VOLUNTEER CAVALRY.

WHEN the writer undertook to prepare a paper on the above subject he entered upon the work with an overwhelming appreciation of the enormous field covered by, and the great importance attached to, this section of military hygiene. To treat of the subject exhaustively and as fully as it deserves in the time here allowed is, of course, out of the question and the writer has only attempted to touch on some of the points which to him seem of the most importance.

Military hospitals, as a whole, differ greatly from their sister institutions of civil life. The former are the outcome of years of experience and thought; of a multitude of happenings; of numerous annoying problems, all of which have been met and in most cases provided for or solved by a general average of the best professional talent, and by men possessing marked ability. The result has been a uniformity of management and a systematic discipline which enables it to maintain the high order of work necessary, and which is the only way to control such a great number of institutions and compel a smooth machine-like accomplishment of the enormous work at times confronting them and necessarily to be done under the most discouraging disadvantages.

The latter, the civil establishments, on the other hand are only subject to such local management, to such local requirements as seem necessary to perform work presenting itself, with as satisfactory results as possible in order for each to maintain its own individual reputation and to produce a certain very necessary finan-

cial success. Hence one of the greatest differences between the two classes of hospitals,—and the great distinctive feature of military hospitals,—is this uniformity of system.

Now let us look briefly over the past history of the Medical Department and its hospitals of the United States. And let me say here that I am greatly indebted to the excellent article of Colonel Hoff, in the February 1902 number of the *JOURNAL* of this Association, for some of the historical facts here mentioned, which indeed it is still more nearly unnecessary to go over, in view of the comprehensive sketches of the Surgeon Generals by Major Pilcher now in course of publication.

The first Military General Hospital, if it may so be called, in the United States was established at Cambridge about 1775. At about this time, however, an arrangement was made to have very serious cases in the Continental army also treated at a hospital at Watertown, New York, so that it too might be considered a general hospital. These two may be looked upon as the seed from which has sprung the present elaborate system of military hospitals. When we think of the difficulties and vicissitudes which have been passed through, the progress has been truly wonderful.

It will be remembered that the first Director General, or Surgeon General as he would now be called, was Dr. Benjamin Church, whose work soon met with an unfortunate termination.

He was at once succeeded by Dr. John Morgan. A stormy path lay before Dr. Morgan, but his sterling character and inexhaustible energy, though not saving him from ill-deserved disgrace in the end, did much to originate and start in the right direction the infant medical department.

Regimental hospitals were at this time organized and as the war then being fought with Great Britain demanded more provision for caring for the sick and wounded, the department continued to grow until 1776 to what in those days was thought to be a fairly good hospital system.

About this time the first hospital regulations calling for the proper recording of cases, etc., and laying down rules for the

government of the attached surgeons and other attendants and for the handling of supplies, were issued and did much to relieve the chaotic conditions.

Still a great deal of friction existed between the officers of the different institutions and effective work was thus greatly hampered. As to the detail work of the hospitals at that time, very little can be learned. And of the work performed and results obtained probably the less known and said the better. With officer pitted against officer and no central organization and, as yet very little done toward putting it on an equal footing with the other departments, its hospitals could not be expected to accomplish much, and the Continental army no doubt suffered greatly from a lack of proper medical attention.

Conditions continued so to the war of 1812, without a definite organization and practically all through the summer of this year, so prominent in the history of our country, with no proper hospital accommodations.

Though somewhat improved as compared with the conditions during the Revolutionary War, and considerably better in point of supplies, the lack of organization was appalling and the hospitals fell far short in effective work of what was to be expected.

In 1813 Dr. Tilton became Physician and Surgeon General. His administration was marked by quite an advancement, especially so in discipline and system. It was also through his efforts that a prescribed uniform for those engaged in the hospital work was adopted. For strange as it may seem, heretofore no regulations bearing on this important point had been enacted. The General Hospital at Burlington, Vermont, was probably the best regulated at this time, and this hospital, as Colonel Hoff well says, is a good illustration of the fact that it is always the man behind the institution who makes it what it is; that it is the hospital with an energetic, hard working, systematic head which turns out the best work.

At the close of the war of 1812, there seems to have been some sunlight breaking through the clouds of chaos and mis-

management hanging over the Medical Department of our military forces.

It was not until this war that any authorized provision for the organization of a trained and competent nursing force was made.

This consisted of the passage of an act of Congress providing for certain hospital stewards, ward masters, apothecaries and miscellaneous or privates as now called.

Here, though only temporary at this time, may be considered the origin of our present hospital corps. Looking back from the now excellent organization, with its systematic training, its rigid examinations, its provision for the best of nurses, male or female, its wonderful equipment and complete and machine-like organization, to this little ill-defined hospital force of 1812, how one is impressed with the great advancement accomplished!

From this point time went on with no extensive progress in actual hospital *establishment*, but still step by step a steady gain for the department, until, at the opening of the Civil war, it consisted of a Surgeon General, thirty (30) Surgeons, eighty-four (84) Assistant Surgeons and (for the times) a comparatively extensive list of General and post hospitals.

Of course, here the magnitude of the struggle confronting the department called for a great increase in numbers and equipment of hospitals.

Great armies were being thrown into the field; battles were being fought, disease attacked the men in camp, and as the war progressed, to keep pace with events, the department was increased until General, Division, Brigade and Regimental hospitals were numbered by hundreds and their attendant Surgeons, Assistant Surgeons, Stewards, etc. by thousands.

In addition, early in 1862 a permanent ambulance corps was found necessary and organized but discontinued when the Army was placed upon a peace footing.

It was during this war that more real advancement in method and organization was made than in all the previous years. However, at the close it was found necessary, as in the past, to reduce to a peace basis and many hospitals were closed and the great

army of surgeons and their assistants in the work was reduced to a mere handful. Little of importance is recorded from this point until 1874, at which time examinations were again held for the purpose of filling many vacancies which had occurred and Congress in an act of this year repeated the provision for a permanent attachment of stewards and the other non-commissioned officers to the medical department, thus giving renewed life to that nucleus from which has sprung the present Hospital Corps; while it was not until 1887 that the act establishing the Army Hospital Corps was finally enacted for the regular service.

It was practically upon this slender peace foundation that the tremendous machine which (thoughtless or malicious criticism notwithstanding) undertook the gigantic work of caring for our forces during the war with Spain in 1898 and since, was built.

The events of this war are too recent to necessitate my going into detail. We all know, the most of us by actual experience, the awful task which met the medical department, either through its regular or its volunteer officers in the camps of unseasoned, and as yet poorly disciplined, troops.

And now to look back over these years of hard work, and perhaps not always the best results, what may we learn?

First in importance seems the necessity of maintaining in time of peace a sufficient organization with abundant equipment and supplies. Not disbanding and reducing our disease-fighting force to such an extent, at least as heretofore, as soon as peace is declared; but keeping up a sufficient hospital force and a sufficient equipment to be equal to any emergency. Men cannot be brought together and trained, supplies and equipment cannot be manufactured on a moment's notice, and no department of our army is needed or sees service so soon as the medical department. In every war, history informs us, the diseases of camp life have begun their ravages before a gun was fired.

Unfortunately military statistics and records regarding the work of the hospitals have been, until quite recently, very irregular and unreliable. In the United States previous to 1840, very little information can be found. Since 1884, however, quite an

improvement in this respect has been made and now complete records of cases and other hospital statistics are kept which will be of great help in future years in the performance of the work of the department.

We can, however, ascertain this, which will give us an idea of the amount of work that hospitals are called upon to perform, that with only one or two exceptions, such as the Franco-Prussian war, at least three-fourths of the mortality of an army in the field has been from other causes than killed in battle and represent therefore, in great part, cases treated in hospitals.

Regarding the correct keeping of hospital records, how few of us who went from civil life or national guard service into the volunteer forces in 1898, but chafed a little under the system of reports which we found it necessary to make.

Will the writer ever forget the schooling he received at the hands of Colonel Maus? Will he ever forget the disgust which he felt when the monthly report of sick and wounded came back the third time with a query as to the name of the poisonous insect whose bite, claimed to have been received sometime during the night, caused an abscess on the knee of trooper so and so? And yet how evident the necessity for it all soon became, and how, what at first seemed useless "red tape," now can be plainly seen to be the simple essentials of correct record keeping. We who are, now that it is all over, frequently called upon to make affidavit for applicants for pensions, wish that even more record work had been done than was.

Comparing our present statistics of hospital service as well as we may with the meager record of that of our earlier wars, we find that modern and more scientific methods in construction and management of hospitals are steadily decreasing the death rate in all armies.

This is especially true outside of the tropics. Unfortunately *there* the climatic conditions are such that the improvement is not so great. To this last is due in great measure the fact that our recent war has been called a war of disease, and yet the death rate in our army during the five months covering hostilities in 1898 was only about 26.9 per 1,000 men, by disease.



The pavilion plan of construction of the General Hospital, as we see demonstrated at San Francisco, giving abundant light and ventilation at the same time affording an easy means of administration and of isolation of contagious diseases, is a great step toward better results.

So also is the field hospital tent as seen, for example in the Munson tent, affording thorough ventilation and yet excellent protection from the sun's rays or inclement weather.

The question of nursing in military hospitals is one of the most vexing and one that gives additional importance to what I have said above, concerning the wholesale reduction of hospital forces at the close of a war. As to the female nurse problem, many things may be said both for and against army female nurses. A great deal of good work has been done by them no doubt, and they probably fill an important place, but it sometimes seems that much said in favor of them is more of a sentimental than a practical nature and whether, in the field, they are really essential or not may still be considered an open question, and one which will continue to annoy the heads of the department for some time to come.

Of course, in time of peace a sufficient number of trained nurses cannot be kept on hand ready to take the field on short notice; on the other hand army nurses cannot be made in a day, neither can the sick in hospital get proper care at the hands of men detailed temporarily from the commands to which a hospital may be attached. This last expedient was found necessary at times during our last war, and anyone at all experienced in the making of troop or company details for hospital service will know that each First Sergeant when called upon to furnish such a detail always picked out the no-account soldiers who were never known to perform any of a soldier's duties correctly; and these men were sent to the hospitals to help save sick men's lives!

A plan which it seems to the writer would overcome this difficulty would be having a squad of men from each organization of the army, selected because of their apparent fitness for this work, detailed to receive special instructions along with the several detachments of the regular hospital corps in hospital work. Then

if the emergency arises which the overworked regular corps of a crowded hospital is unable to meet, every troop of cavalry, every company of infantry or battery of artillery will have a certain number of trained hospital workers ready for detail and use.

Another point of which I might speak is the disadvantage to which military surgeons are sometimes put in not being able to use some of the newer, perhaps still to a great extent experimental, appliances or remedies.

A physician or surgeon in a civil hospital may, on his own recommendation, and without any great loss of time, adopt and use any of the newest methods or remedies which he may deem advisable, while his professional brother of the army must conform to certain prescribed lists of drugs or medical supplies, which though aiming to include everything necessary, are unfortunately not always up-to-date. Or if he would procure that which is not listed he must obtain, by means of a special requisition, the approval of his superior, perhaps stationed at a distance, to its purchase and use. This means delay at least, and delay some critical cases will not admit of.

The writer remembers an instance which came to his notice at the hospital of a Western post. A patient was suffering with an attack of pneumonia of unusual severity, and so far none of the older methods seemed to be giving results. I had a short time previous been very fortunate in the use of anti-pneumococcal serum, and upon being asked, suggested its use in the case at hand, but was informed that it had not as yet been sufficiently proven to have been adopted by the United States Medical Department and to get it in time it would be necessary that the surgeon in charge buy it himself, trusting to the approval of those above him for reimbursement. Of course, government cannot be expected to keep in stock at even its principal stations all of the new medical supplies, etc., presented to our profession, but I cite this experience simply to show that there are times when some simpler and more direct means of obtaining *even experimental* and unestablished supplies, are quite necessary.

I believe some regulation providing for an emergency might

be made enabling the attending surgeon to purchase that which he needs as readily as his civil co-laborer, without causing, to any great extent, unnecessary expense.

I trust I will be pardoned if before closing I refer to a subject which has long been a "bone of contention" but which I believe will still bear some further discussion: That is the *regimental* hospital. Much has been said and correctly too, as to the necessity of having medical forces centralized as much as possible in order to better meet the demands upon it during an engagement or any stress of overwork. This is perfectly correct and is probably the best way to economize both labor and supplies while engaged in active hostilities, but there is a time while, for instance, the forces of an army are lying in permanent camp, when the regimental hospital plays an important part, especially in volunteer regiments.

Here it is that so many soldiers, becoming too ill to be returned as "sick in quarters" and go to the hot and uncomfortable company tent, and yet are not cases of such severity, as to require being transported to a division hospital, with its large number of sick around them, its strange nurses and strange attending surgeons,—if allowed treatment in a small two or three tent regimental hospital, under the care of their own regimental surgeons, would, in a few days, and perhaps much sooner than in a Division Hospital, be able to return to duty. This is especially true of volunteer forces, where often an intimate acquaintance exists between medical officers and the men of the regiment, and where much is expected from this personal acquaintance by that not to be ignored element, "the friends at home."

I do not mean to detract from the important place which the more general hospitals fill, but my own experience, comparatively limited though it has been, has convinced me of the need of an intermediate grade of treatment, especially in camp, between that received in quarters and the Brigade or Division Hospital.

## THE RED CROSS SOCIETY OF JAPAN.

By COLONEL NICHOLAS SENN,

CHICAGO, ILL.

SURGEON GENERAL OF ILLINOIS, LATE LIEUTENANT-COLONEL  
AND CHIEF OF THE OPERATING STAFF IN THE FIELD IN THE  
SPANISH-AMERICAN WAR; LIFE MEMBER OF THE RED  
CROSS SOCIETY OF JAPAN, ETC., ETC.

THE Red Cross Society of Japan is based upon an organization formed during an insurrection in the south-west provinces in 1877 with the object of caring for the sick and wounded in the hostilities connected therewith. As indicative of its character the organization adopted the name of "Hakuaisha," or Society of Benevolence. At the close of the campaign the society effected a permanent organization with a view to similar action in other like emergencies.

With the adhesion of the Japanese Government to the Geneva convention this society was transformed into the Red Cross Society of Japan and became a member of the fraternity of Red Cross Societies throughout the world. The growth of the organization has been phenomenal. Its membership now numbers 800,000, which, estimating the population of the country at 45,000,000, would give it a representative in nearly every family in the Empire. The reasons for this very remarkable prevalence may be found in the strong official influence back of it. The Imperial family is deeply interested in and contributes largely to it. An Imperial Prince is its Honorary President and a Princess the President of the Ladies' Committee. The Empress is a frequent visitor to the headquarters of the society and to the Red Cross Hospital. Moreover the medical profession is held in the highest estimation by the Imperial family.

Baron Ishiguro and Baron Hashimoto, the leaders of the medical profession in Japan, have been the guiding spirits in promoting the growth and development of the society, and back of

them has been the strong support of a united profession. The Japanese have responded promptly and liberally to these influences.

Much credit must be given also to the fact that the Japanese people are fully imbued with the spirit of progress and that they are well aware that they have entered upon a stage in international life that may bring at any time serious emergencies which they should be ready to meet, and so they have been quick in making ample preparations for hostilities before the horizon of peace should be darkened by the clouds of war, and among these the work of the Red Cross Society has been a most important factor. Popular interest in the subject has been maintained by great public assemblies of the Society to which members gather from every part of the Island Empire once a year, when lectures are delivered by medical men with stereopticon illustrations showing the actual practical work of the society. These meetings are usually held in Uena Park, Tokyo, and the attendance is seldom less than 200,000. Baron Ishiguro informed me that the lantern illustrations attracted a great deal of attention and were probably the most important factor in popularizing the organization, and as a means of practical instruction in first aid work.

The headquarters of the Society are in Tokyo and consist of a number of buildings occupied as central office and storerooms. Through the courtesy of Barons Ishiguro and Hashimoto, I was privileged to inspect every department, as well as the military school and hospitals.

The central office is a capacious, well lighted and luxuriously furnished room. Adjoining this is an apartment set aside for the Imperial family to which elegant furniture and oil portraits of the Emperor and Empress impart a thoroughly royal aspect.

It was the contents of the storerooms, however, that astonished me with their vivid evidence that Japan was well prepared for war. The amount of hospital supplies was something enormous. Stacks of uniforms and black dresses and white caps for female nurses, lanterns, canteens, blankets, bedding, cots, medicines, tents, wagon loads of dressing materials, field chests, litters and trains of ambulances filled the many capacious rooms to

their ceilings. Within a day or two the Japanese Red Cross Society can load a hospital ship or railroad train and leave for the seat of war without causing the least anxiety or confusion. Medical officers and nurses are ready at all times to respond to the call, and the arrangements of the hospital stores are so systematic that they can be assembled and transported in the briefest possible period. The Red Cross medical officers and male and female nurses are under military discipline and do their work in the hospitals behind the fighting line.

The Society owns and operates two hospital ships, the *Hakuai-Maru* and the *Kosai-Maru*, [which are fully described in the translation by Lieutenant Barney in this number of the *JOURNAL OF THE MILITARY SURGEONS*.]

The Red Cross Hospital in Tokyo stands the highest of the many fine hospitals in that city. Here the Red Cross female nurses receive their education and training. It has a capacity of 250 beds and its attending staff is selected from the leading members of the profession in the city. The central figure of the staff is Baron Hashimoto, a retired Surgeon General of the Army. The instruction of the nurses by the members of the attending staff is of the most practical kind. They are made nurses, not half doctors, as is the case with many other training schools. They serve an apprenticeship of three years, and on passing a satisfactory rigorous examination, receive a certificate which entitles them to engage in private nursing, and in the event of war, to employment in military service. They compare well with the trained nurses of America, and it seems to me are in many ways better adapted for service in the field, as their needs are few and their quiet, gentle behavior cannot fail to secure for them the respect and confidence of the disabled soldier.

It may be seen then that the Red Cross Society of Japan is entirely capable of meeting the present emergencies of the existing hostilities, and that there is no demand as yet for additional help.

## Reprints and Translations.

### JAPANESE HOSPITAL SHIPS.\*

FROM THE FRENCH OF DR. TESSIER, OFFICER IN THE FRENCH  
SERVICE OF MARITIME SANITATION.

BY LIEUTENANT CHARLES NORTON BARNEY.

MEDICAL DEPARTMENT, UNITED STATES ARMY.

AS Japan's principal territory consists of several large islands, of which only two—Kiu-Siu and Nippon—have railroads, she cannot rely on hospital trains as the chief means of evacuating her sick and wounded, and for a long time has planned to use hospital—or rather ambulance—ships. In the Chino-Japanese war she utilized transports; and as soon as the Treaty of Shimonoseki was signed the Japanese Red Cross Association resolved to have two ships specially constructed for ambulance and hospital service in time of war. As it would have been too expensive to reserve these ships exclusively for such service it was arranged that the great Japanese steamship company "Nippon-Yusen-Kaisha" should buy them at cost price, paying for them in twenty annual instalments, use them ordinarily for its own purposes as passenger and freight steamers, and turn them over to the Red Cross at such times as the latter should consider it desirable to have them.

These two ships, the "Hakuaï-Marû" and the "Kosai-Marû," were built on the Clyde in England. Both were constructed on the same plans. Each has a displacement of 2700 tons, a draught of six meters, length 95 meters, beam 12 meters, and a speed of 15 knots an hour.

In the upper deck are the saloon and cabins, a disinfecting room, laundry, galley, hoist, lamp-locker, bath-rooms and water closets. Three of the staterooms on this deck are assigned to the Red Cross delegate and his secretary, two to officers of the

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\*Navires-hôpitaux japonais—Par M. le Dr. Tessier, médecin sanitaire maritime. *Le Caducée*, February 6, 1904.

Imperial Navy and interpreters, one to the chief medical officer, and others to the officers properly belonging to the ship.

In the 'tween-decks are the state-rooms of the junior medical officers, of the pharmacists, and of the female nurses, and a mess room for the latter. The hospital which is situated in this part of the ship, is composed: aft, of several state rooms holding in conjunction 45 cots reserved for officers; further forward, of state-rooms and a large ward capable of holding 115 non-commissioned officers and soldiers; still further forward, and separated



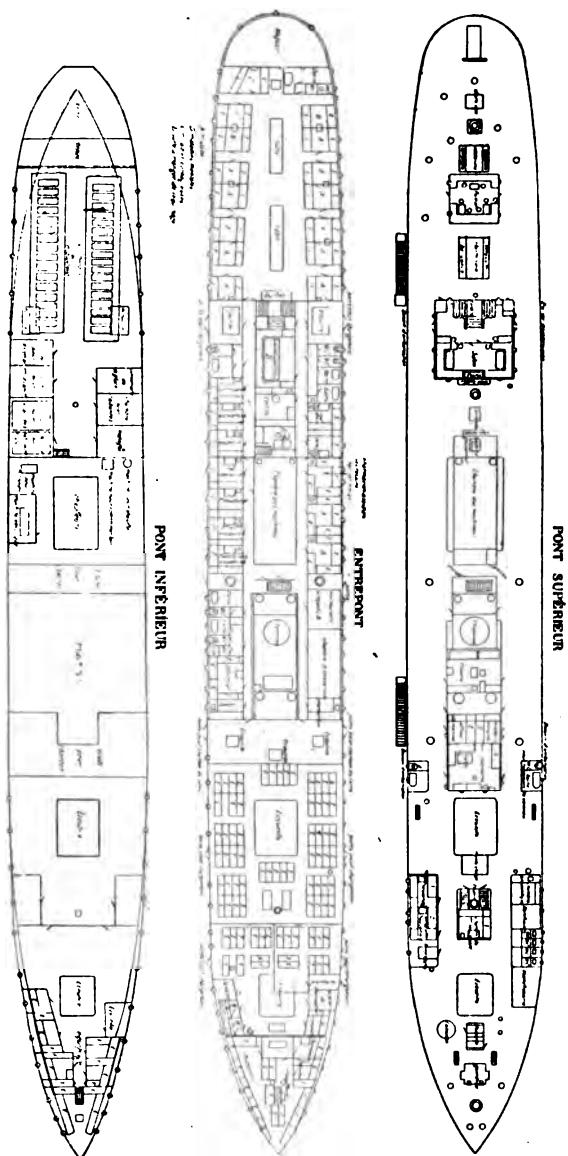
**The Japanese Red Cross Hospital Ship, Kosei-Maru.**

from the others by a bulkhead, is a ward of 42 cots for contagious cases. There are also on this deck operating rooms, dispensary, radiographic room, laboratory, bathrooms, etc.

The lower deck comprises the quarters of the hospital corps, a mortuary, an ice-plant, a refrigerating room, a baggage room, and store-rooms; further forward machines for cooling and compressing the air, used in the artificial ventilation of the ship, and the boilers; and way forward the quarters of the crew.

The medical personnel embarked includes among others, a delegate from the Red Cross, a chief medical officer, three junior





Plans of the Japanese Red Cross Hospital Ships, Kosei Maru and Hakua Maru.

The figures indicate the number of beds in each cabin.

medical officers, a pharmacist and an assistant pharmacist, a secretary or chief clerk, a chief of female nurses, two hospital sergeants-major, two female nurses (chiefs of squad,) two hospital sergeants, nine female nurses, twenty-eight hospital corps soldiers, an instrument sharpener, a laundryman, interpreters, etc.

The name *Hakuai-Mar* signifies "Boundless Love" or "Benevolence." This ship was on her way to Shanghai, when she received orders, on the 28th of June, 1900, at the beginning of the international intervention in China, to get ready for active war service. After being fitted out at Yokohama, she started for Taku on the 7th of July. Between the 7th of July and the end of April she made seven trips from China to Japan, transporting in all 1538 patients, of whom 1420 were disembarked at Ujina and 21 died on the way.

The name *Kosai-Mar* means "Eternal Charity" or "Beneficence." This ship likewise made seven trips from China to Japan between the 28th of July and the 18th of November, 1900, and transported 1328 sick to Ujina.

These ships carried to Japanese military hospitals, patients not only from the Japanese forces, but also some from others of the allied forces—123 of the French, for example.

#### THE NAVAL HOSPITAL SHIP, KOBE-MARU.

IN the Chino-Japanese war of 1894, the "Kōbe-Mar" a Japanese mail steamer, was adapted to hospital purposes and contributed most effectively to the service of the sick and wounded. It was provided with wards for surgical, medical, infectious and insane cases, a disinfection room, an operating theater, a laboratory and other necessary quarters. The medical staff consisted of three surgeons, three surgeon probationers, a pharmacist and nine sick berth attendants and assistants. The ship had a capacity of two hundred patients, although on account of the fine transport service which existed, her full capacity was never taxed—not more than fifty patients ever being carried at one time. The total number of patients received, during the war, August 1894-August 1895, was 696, of whom 90 were wounded in action, one a Chinese captive, and 605 were sick and wounded otherwise than in action.

## RUSSIAN MILITARY MEDICAL AFFAIRS.

BY M. LE DR. TISSIER,

MÉDECIN SANITAIRE MARITIME.

THE question of hospital ships, so important to the Japanese, is of but little consequence to the Russians, whose fleet is blockaded. If it should become active however it is probable that the powerful and patriotic Red Cross would come to its aid as in the war with China.

At that time it took a freight steamer with a tonnage of about 3000, and transformed it into a hospital, under the name of *Czaritza*.

On the upper deck were the quarters of the medical corps and some rooms for sick officers. In the 'tween decks were two large saloons serving for the hospital; the beds were large and moveable; in the center of each ward was a dining table and connected with them were bath rooms and lavatories; the surgical ward also contained every thing necessary for wound dressing.

The operating room was located in the 'tween decks and was provided with two operating tables, a sterilizer and an instrument case; it was lighted during the day by a skylight and at night by electricity.

The dispensary although small, contained numerous medicines and every thing necessary for chemical and bacteriological examination.

The ship could accommodate 156 patients; it was lighted by electricity, heated by steam and the drinking water was distilled on board.

The medical personnel consisted of three civilian physicians, and a military pharmacist having under orders eight male and six female nurses.

What the Russian Red Cross did in 1900-1901 is nothing in comparison with the enthusiasm that prevails today. Gold pours into its treasury from all directions, both for the treatment of the

wounded and sick and for the care of the families of the disabled.

The military Red Cross has now mobilized twenty-six field hospitals with 5050 beds.

A sanitary railway train left recently for the scene of hostilities. It comprised eight cars for the sick, of which four were reserved for the severely injured and four for the more slightly wounded. There was also a cook's car, a medicine car, an operating car, two cars for linen and clothing, and a car for wounded officers.

Numerous other Red Cross trains have left St. Petersburg for the far east. The ladies of the Red Cross, the "sisters of charity" as they are called in Russia have freely entered upon their mission of devotion and abnegation. They come from all classes of society; they are both old women and young girls: and are attired in the classical nursing uniform, with the white cap and the shoulder cape.

It is more than probable then that the Russian Red Cross will take a prominent part in the sanitary service in Manchuria and assume a position of much greater importance than is allowed to it by the regulations of other European armies.

The medical department of the Russian army has long been embarrassed by its peculiar and awkward organization. Medical officers have had no military rank but have been rated as civilians with relative official—not military—rank among themselves. The medical inspector general, who is the head of the medical department, is the chief of the ninth division of the ministry of war and has in his charge the direction of the medical personnel and material. The administrative feature is however in charge of a Hospital Commission, attached to the second division of the ministry and composed of officers of three other departments in addition to the medical inspector general. This distinct separation of the "sanitary direction" and "hospital inspectorship" continues down through the entire medical work and has proven obstructive in a high degree. It has been proposed to correct these evils by (1) uniting the disjointed functions into a single department and (2) by conferring military rank upon medical officers, propositions which appear to have the approval of General Kuropatkin and which it is hoped he officially acted upon before his departure for the orient.—*Le Caducée*.

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**JAMES TILTON.**  
**PHYSICIAN AND SURGEON GENERAL OF THE UNITED**  
**STATES ARMY—1813-1815.**

## Editorial Department.

### The Surgeon Generals of the United States Army

VII. JAMES TILTON, PHYSICIAN AND SURGEON  
GENERAL OF THE UNITED STATES ARMY,  
1813-1815.

ON the first of June, 1745, in the county of Kent, then one of the three "lower counties" of the province of Pennsylvania, but now of the state of Delaware, was born James Tilton, the seventh chief of the Medical Department of the military forces of the United States. Left fatherless at the age of three years he was bred and educated by a mother whose strong character made a profound and enduring impression upon her distinguished son. When he had attained a suitable age, he entered upon the study of medicine, under the preceptorship of Dr. Ridgely, a prominent physician of Dover and completed his preparation for practice in Philadelphia at the school of medicine established there by two of his predecessors in office,—Drs. Morgan and Shippen,—being one of the first class in the institution to receive the degree of M. D.

He then set out upon the practice of medicine at Dover in his native province and quickly won the confidence and esteem of the public. His career here was however brought to a sudden termination when in 1776 his patriotic enthusiasm led him to become attached to the Delaware regiment of the revolutionary forces as surgeon at the munificent pay of \$25.00 a month. In this capacity he saw much active service, participating with the regiment in the battles of Long Island and White Plains and accompanying it on the fateful retreat to the Delaware. He was then stationed at Wilmington in charge of the sick of his command and passed the winter of 1776-77 in that manner.

His devotion to duty was recognized in the following summer

by appointment as Hospital Surgeon and he was placed in charge of the hospital at Princeton. Here he became strongly impressed with the evils of the then existing hospital arrangements and was particularly opposed to the combination of the offices of Director General and purveyor of supplies in the same person—a condition to which many objected but which for some reason died hard. He also fought strenuously against the overcrowding to which the hospitals were unnecessarily subjected. In course of his work he became infected with typhus, his recovery from which he attributed to the attention of his colleague, Dr. Benjamin Rush, and the nursing of a lady of the neighborhood who took pity upon his sufferings. He was off duty for nine months, a part of which time, however, he utilized in a study of the military hospitals at Bethlehem, Reading, Manheim, Lancaster and Newport. During the campaign of 1778–79, he commanded the hospitals at Trenton and New Windsor and in 1779–80, he was able to materialize with great success a pet theory with regard to “hospital huts” built of logs with free ventilation through the interstices, aided by fires built upon the hard earthen floors with an aperture for the escape of the smoke in the center of the roof.

When the medical department was reorganized in 1780, his name appeared at the head of the list of “hospital physicians and surgeons.” He found the medical situation however still so obnoxious that he resolved to resign unless it could be improved, and meanwhile personally repaired to Philadelphia and laid his views before the medical committee of Congress and later before a special commissioner with the result that marked reforms were instituted. He then continued with the Army, and accompanied it on the momentous campaign in Virginia. While at Williamsburg he became involved in what he called a “petite guerre” with a French officer by whom he had been under protest turned out of quarters. The quarrel subjected him to a long lecture from Count Rochambeau upon politeness to friends and allies, together with an intimation of the likelihood of punishment in case of obstinacy. He afterwards was reinstated in the Count’s good graces however and enjoyed his good will to the close of the war. He then remained in Virginia to the end of the campaign witnessing the battle of Yorktown and the surrender of Cornwallis.



A year previously he had been tendered a chair at his alma mater, but declined the honor, preferring to remain with the army until its disbandment in 1782. He then returned to Dover, where he was promptly elected to Congress, and, after serving a term in that body, was repeatedly chosen to represent his district in the state legislature. And now followed a long period of civil life devoted to active professional work with horticulture as a fascinating recreation, For a considerable time he also held the office of Commissioner of Loans for his state. The climate of Dover proving unfavorable to his health he fled to the hills of Newcastle county and passed the remainder of his days, save only the period of his reappearance in the military service, in the neighborhood of Wilmington.

He had arrived at a time of life which would justly entitle him to retirement and rest from the onerous duties of a laborious profession when in 1812, "war's loud alarms" again aroused his interest in military medicine, and he prepared a little treatise embodying "*Economical Observations on Military Hospitals; and the Prevention and Cure of Diseases Incident to an Army. In three parts addressed: I. To ministers of state and legislatures; II. To commanding officers; III. To the medical staff*," which was published in Wilmington early in 1813, and which doubtless was the moving factor in his selection as "Physician and Surgeon General," when that office was established by the army staff organization act of March 13, 1813. In this work he elaborated his objections to large and overcrowded general hospitals and accentuated the desirability of distributing the sick in small regimental hospitals. He enlarged upon the theory of hut hospitals, which he had so successfully worked out in the previous war, advised the establishment of medical boards for the administration of the medico-military affairs of the several military districts into which the country was then divided, and provided for the entire separation of the purchasing and administrative work.

His country's call found this fine old Roman in bucolic seclusion amid his flocks and herds and carrying the burden of three score and eight winters upon his shoulders, and it was with great reluctance that, like a medical Cincinnatus, he again em-

erged into active service and that only upon the assurance that his duties should be in the main administrative with headquarters at Washington near his rural home. Promptly upon the acceptance of his commission, however, he set out on a tour of inspection along the northern frontier. The contempt of all sanitary conditions and the resultant direful consequences which he discovered are a part of the history of the war, but a more important chapter, to which less frequent reference is made is the course which he took to remedy the defects and rehabilitate the medical and hygienic service of the army. This he accomplished by working along the lines indicated in his book. "Lake Fever," as the prevalent variety of typhus was called, which had become so alarming as to threaten the destruction of the whole army and entirely terminate enlistment, was extinguished and numerous other improvements were inaugurated,—greatly to the reduction of the sick rate and the advancement of the efficiency of the troops. One of the most important results of his administration was the "Regulations for the Medical Department," published in General Orders in December 1814. Here for the first time in the history of the army, the duties of medical officers and the other medical personnel were clearly defined.

He had planned to inspect the forces on the north again in the spring of 1814, but he was prevented by the development of a cervical tumor, which greatly disabled him. This was followed again in July by the appearance of malignant disease in his leg, which entirely precluded active service even of the mildest type until the army was disbanded in June, 1815. The affection continued to progress meanwhile and six months later it was decided that amputation at the knee was necessary to preserve life. Accordingly on the seventh of December the operation was performed with all the terrifying accessories of pre-anaesthesia days. Regarding this event McLane says: "To an intimate friend who was present, whilst the surgeon was taking off the limb, he spoke of it as the greatest trial to which he had ever been exposed. But his religion and fortitude did not desert him on this trying occasion; when he had once made up his mind to submit to it, he remained as firm as the pyramid in the tempest, and, whilst

his friends sympathized around him, he calmly gave directions to the surgeon and medical assistants. This fact alone, when we consider his age, which was then upwards of seventy, and his previous sufferings, incontestably proves his mind to have been one of no common texture."

Dr. Tilton, although of a spare habit was of a jovial disposition, and although a bachelor was fond of company, young and old. He was very tall,—six feet six inches,—and his hair and complexion were dark. His isolated life was doubtless the cause of the individuality which characterized his every act. A contemporary remarked that, "whether he walked or sat still; whether in conversation or mute; whether he ate, drank or smoked; whether in a grave mood or indulging in his loud laugh, all was in a style peculiar to himself and most remarkable." He drank neither tea nor coffee and plumed himself upon the fact that he had neither cups nor saucers in his house. He was honesty and frankness personified.

He evinced a never failing interest in the progress of his profession and was always "guide, philosopher and friend" to the young practitioners of his neighborhood. He was not unmindful too of the advantages to be derived from attrition with his compeers and was early elected to membership in the American Philosophical Society, while his state medical society always found in him one of its most enthusiastic members and active workers, and elected him to its presidency on numerous occasions.

He was not a prolific writer, however, and, aside from his doctorate thesis, "*De Hydrope*," and his "*Economical Observations*," already mentioned, the products of his pen were limited to four pamphlets on agricultural subjects.

He built for himself a stone mansion upon a bit of elevated ground overlooking the city of Wilmington; here he passed his declining years surrounded by the fields and gardens he loved so dearly, and here too upon the 14th of May 1822 he finally closed his eyes and sought immortality.—JAMES EVELYN PILCHER.



**The Hall of International Congresses, Universal Exposition, St. Louis, 1904.**

#### THE HOUSING OF THE ST. LOUIS MEETING OF THE ASSOCIATION.

**T**HE next meeting of the Association of Military Surgeons is to be held in the superb Hall of International Congresses on the grounds of the Universal Exposition held in commemoration of the Louisiana Purchase at St. Louis. The building is situated directly west of the Administration building and is 257 feet long and 46 feet deep. There is also another structure in the rear of the center of the Hall of Congresses, 100 feet long and 41 feet wide. There are thus provided three large assembly halls, two of which are 110 feet by 46 feet, and the third 100 feet by 41 feet. In these halls will meet the largest sections of all the congresses to be held during the exposition.

The International Congress of Military Surgeons, the form which the thirteenth annual meeting of this Association will take, will hold its sessions in assembly room No. 1 of the Hall of Congresses where a seating capacity of 1000 will afford ample accommodations for the members and delegates in attendance. Ample provisions for registration and reception rooms, committee rooms and other desirable arrangements will also be afforded under the same roof. It is evident then that the meeting will be well housed and every facility present for the convenience and comfort of the participants in its work.

## Reviews of Books.

### THE LAW IN ITS RELATION TO PHYSICIANS.\*

**T**HIS is a particularly useful and valuable work. It does not claim to be a treatise upon medical jurisprudence, but it covers a most important portion of that subject, a portion which is becoming continually more important to the practitioner and includes the relations of physician and patient in all their legal phases. The chapter upon civil malpractice is particularly valuable while that upon privileged communications contains many interesting facts which the writer has not hitherto seen in works of the kind.

### THE TREATMENT OF FRACTURES.†

**D**R. SCUDDER has clearly struck a popular note. Four editions of a scientific work in less than that number of years is a remarkable record in medical publishing, and a critical examination of the work easily demonstrates the reason for this condition. The first edition was valuable and its teachings were safe and conservative while each successive edition has presented noteworthy improvements. Dr. Scudder's style is clear, succinct and definite, but the feature in which his work particularly excels is illustration. In no work of the kind hitherto published has the pictorial phase been so extensively utilized as in this one. The photograph and photo-engraving have been adopted enormously to the advantage of the reader and the value

\**The Law in Its Relation to Physicians.* By ARTHUR N. TAYLOR, LL. B. sm. 8vo; pp. 559; New York and London, D. Appleton & Co., 1904.

†*The Treatment of Fractures. With Notes Upon a Few Common Dislocations.* By CHARLES L. SCUDDER, M. D.; 4th edition; 8vo; pp. 534; 688 illustrations. Philadelphia, New York and London, W. B. Saunders & Co., 1903.

of the book. Skiagraphy has assisted greatly in this respect, the discovery of Roentgen having been employed extensively. An interesting chapter upon gunshot fractures adds much to the value of the work from the standpoint of military surgery, being well wrought out and embodying the most recent views of military surgeons. An elaborate bibliography closes the work and indicates how thoroughly the author has investigated the subject, while the work itself is an index to the completeness with which he has utilized his material.

#### INTERNATIONAL CLINICS.\*

THE fourth volume of the thirteenth series of International Clinics well sustains its reputation for scholarship and timeliness, the several departments of Treatment, Medicine, Surgery, Gynecology and Obstetrics, Neurology, Orthopedics, Ophthalmology and Pathology, all being represented by well digested and carefully considered papers. As especially interesting may be mentioned a valuable article by Dr. Andrew Duncan upon Tropical Dysentery, another by Messrs. Battle and Corner on the Differential Diagnosis of Acute Surgical Abdominal Conditions, together with interesting clinical lectures by Professor Keen of Philadelphia and Colonel Senn of Chicago.

#### CHEMICAL ANALYSIS OF WATER.†

THIS is a brief statement of the essentials of the subject based upon notes taken in the laboratory of the Army Medical School and will make a useful little remembrancer of the subject.

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\**International Clinics* Edited by A. O. J. KELLY, A. M., M. D. Vol. IV thirteenth series; 8vo; pp. 321. Philadelphia, J. B. Lippincott Co., 1903.

†*A Guide to the Chemical Analysis of Water*. By M. M. CLOUD, M. D., U. S. A.; 24mo.; pp. 24. Kansas City, Hudson-Kimberly Publishing Co., 1903.

## ORGANIZATION AND CONDUCT OF A UNITED STATES ARMY MEDICAL SUPPLY DEPOT.

BY COLONEL J. MORRIS BROWN.

ASSISTANT SURGEON GENERAL IN THE UNITED STATES ARMY.

**F**OR furnishing medical and hospital supplies for the Army, the Government maintains three general Depots, located respectively at New York City, N. Y., St. Louis, Mo., and San Francisco, Cal.

It was the writer's privilege, for the greater part of five years, to have charge of the first mentioned, and the following is founded on the experience of that time.

### ORGANIZATION.

In the organization of a Depot, the force of employees should consist of Chief and Disbursing Clerk, Correspondence, Bill, Invoice, Auditing, Property, Order, Receiving and Shipping, and Copying Clerks, and such number of Packers and Laborers, as may be necessary for the transaction of business. These employees, if men of experience, furnish the basis of a system which, in an emergency, can be expanded so as to take care of a largely increased business.

While the titles given these various employees would seem to indicate, very clearly, their duties, a somewhat fuller explanation is deemed necessary to a correct understanding.

The Chief and Disbursing Clerk is the head of force, and has under his charge, not only the routine paper work, but has exclusive charge of all money papers, and is, under the officer in charge, responsible for the correctness of all disbursements.

The Bill Clerk has charge of all accounts of purchases, must compare the bills with the quotations, and be certain that the computations are correct.

The Auditing Clerk keeps in a register, a record of all supplies ordered, makes out all the contracts, and compares bills with register, to see that the correct articles have been delivered.

The Property Clerk has charge of the return of property, which is made quarterly, in duplicate. At this Depot, the vouchers have for some time averaged about four hundred and fifty per quarter. His work must be accurate, as a very slight error, carried forward, would complicate all future accounts.

The Order Clerk makes out the written orders for supplies, and also the Circulars inviting informal proposals, and the Abstract of the same.

The Receiving and Shipping Clerk receives all articles delivered, and keeps a record, in the proper register, giving each delivery and serial number; he ships all property, and enters in the register for that purpose, the number of package and the destination, and takes receipt in this book for the shipment.

One of the packers, designated Chief Packer, is in charge of the Issuing Room. He must see that at all times he has sufficient stock on his shelves to meet the daily wants, and when filling requisitions must enter in the register of "Contents of Packages" every article issued, make out the packer's list and the "turn over" on which transportation invoice is based.

#### PURCHASES.

Under the law, supplies are purchased only after advertisement, except in cases of emergency, or when it is impracticable to receive competition. The question of an emergency is determined only by the necessity for immediate issue.

If the purchase is to be a large one, lists, in Circular form, are issued, and a period of thirty days from date allowed, before the proposals are opened. During this time prospective bidders are expected to examine carefully the standard samples, with the view of furnishing the identical, or an equally good article. When the proposals are opened, an abstract is made, and, with a list of parties, to whom circulars were sent and a list of the bidders, is sent to the Surgeon General, who awards the contract, and instructs the Officer in Charge to enter into written agreement for the delivery of the articles. If the award is for a drug or medicine, for which no standard is provided in the U.S. Pharmacopœia, the bidder is required to furnish a sample of the article he proposes to deliver, for examination by the chemist,



and if it is satisfactory the contract is made. When the articles are delivered, in the case of drugs and medicines, a sample is taken, at random, and sent to the chemist, for comparison, and if, after examination, he reports favorably, the article is accepted, and put in stock; but if his report is unfavorable, the contractor is required to remove the articles, and deliver a new lot. In case of articles, other than drugs, the articles delivered, are compared with the standard sample, by the Officer in Charge, and determined whether they are equal thereto.

If the purchase is to be a small one, the time allowed before opening proposals may be but ten days, or even less, and the award may be made by the Officer in Charge; and as the goods are to be delivered at once, no contract is made, but simply an order for the goods as quoted.

These goods are inspected and accepted by the Officer in Charge. As to very many articles, not on the supply table and for which there is no standard sample, the inspecting Officer must use his own judgment. In case of drugs and medicines he can be guided only by the standing in the commercial world, of the house from which the purchase is made. When the goods are delivered and the bill for same rendered, it is sent to the Receiving Clerk, who enters on it, the date and number of the delivery, and signs it; from thence it goes to the Auditing Clerk who compares it with the order, and signs it; from thence to the Bill Clerk, who makes out the account ready for payment.

#### STORAGE.

For the proper accommodation of a Depot that is to furnish Medical and Hospital Supplies for an Army of 75,000 men, for a period of six months, not less than 40,000 square feet is necessary. This space should be divided into rooms for receiving, storing, packing, and shipping, and the necessary offices. The packing room should be arranged with a table sufficiently large to hold all the articles called for on an average requisition, and shelving, closets, drawers, and bins for a fair amount of every article carried in stock, sufficient for the daily requirements.

The rooms for the storage of the general stock should be large, light, and well ventilated. The stock should be arranged

in alphabetical order, according to class, with aisles of sufficient width to admit a truck.

Special storerooms for instruments, standard samples, should be provided with shelving for the proper classification of these articles.

I believe it to be better, on account of the large and diversified list of stores carried in stock, to have a reliable man in charge of each room, rather than one general storekeeper.

#### ISSUES.

When a requisition is received it goes to the Correspondence Clerk, and is entered in the "Book of Requisitions Received", given a number, stamped with the date, and returned to the Officer in Charge, who sends it to the Chief Packer, who gets out such articles as are in stock, has them packed and makes an entry in the "Packing Book" of each article, and the quantity, as it is packed, giving each box a serial number; he then makes a copy of this list, and the turnover (i. e. list of packages) and sends them with the requisition to the Officer in Charge, the requisition is then sent to the Order Clerk who then, if it is an emergency, makes out the necessary orders for the goods, and instructs the merchants to mark the packages in such a way that they will be easy of identification, and returns the requisition to the Officer in Charge. If it is not an emergency the Order Clerk makes a transfer (i. e. a list of articles still due) gets out the Circular Letter for proposals, and gives the transfer to the Officer in Charge, who holds it until the goods are delivered.

When the goods ordered are delivered, the Receiving Clerk, after entering the list in the Record of Articles received, turns them over, with a memorandum bill to the Chief Packer, who calls on the Officer in Charge for the requisition; these goods are then packed, the boxes numbered, and the papers sent to the Officer in Charge, who directs the making out of the Transportation invoice, and the requisition then goes to the Invoice Clerk, three copies of the invoice are made out and numbered, one copy with two blank receipts are forwarded to the receiving Officer, who, when he receives the goods, makes out his receipt, and sends it to the Officer in Charge who compares it with the invoice, sends

a copy of the invoice to the Surgeon General's Office for file, and retains the third. The transportation invoice giving the number of packages and the serial number is sent to the Quartermaster, when the goods are called for, the shipping clerk, having a list of the serial numbers, erases each number as it goes out, and signs and dates it and sends it, with the truckman's receipt to the Officer in Charge. The Quartermaster subsequently furnishes a receipt showing the number of packages and the serial number of each package. When the whole transaction is complete, by the official receipt of the Receiving Officer, all papers, consisting of Requisition, Turnover, Transportation Receipt, and one copy of invoice are given the same number, and filed with the retained return by the Property Clerk.

It will be seen that the Officer in Charge must make his desk a clearing house, in order to be constantly in touch with the business of the depot.

#### REPAIR SHOP.

Since the close of the Spanish war, very large amounts of property have been returned to the Depot, and, on examination have been found to be unserviceable, but repairable. I have found that the furniture can be repaired at very slight cost, by a small shop in connection with the depot, and have no doubt but that the saving thus made, is greatly in excess of the wages paid to the mechanic.

#### SPANISH WAR EXPERIENCES.

Under peace conditions the work is routine, but the system is deemed sufficiently elastic to meet any emergency. It may be of interest to have some of the writer's experiences during and since the Spanish war.

When suddenly in 1898 war was declared, the Medical Depot in New York, occupied a small portion of the Army Building in Whitehall street, having approximately, for all purposes, not to exceed 7,000 square feet of space.

While this space was sufficient for the small portion of the Army supplied from this Depot in peace, it was entirely inadequate to meet the enormously increased business, and although additional space was rented, for the period of nine months, more than half the

business of the Depot was transacted on the sidewalk, thousands of packages being received, marked, and shipped to their destination therefrom.

The territory supplied from this Depot, included the posts in the North, East, and Middle States, and along the Atlantic coast, including Florida, and after the surrender of Santiago, the troops serving in Cuba, and Porto Rico, together with the large camps at Fall Church, Va., Hempstead, and Montauk Point, L. I., Jacksonville, Fernandina, and Miami, and later the Philippine Islands very largely. Daily shipments of supplies were made to these various points, and as a matter of interest I give a list of number of packages and the gross weight, covering the period from May to December, 1898.

May, 1,089 packages, .....	gross weight	135,132 lbs.
June, 3,069 " .....	" "	293,283 "
July, 5,726 " .....	" "	529,912 "
Aug. 6,680 " .....	" "	657,361 "
Sept. 5,757 " .....	" "	526,883 "
Oct'r, 7,160 " .....	" "	511,019 "
Nov., 5,527 " .....	" "	419,911 "
Dec., 3,743 " .....	" "	311,318 "

—making a total for the period of eight months of 39,749 packages with the gross weight of 3,378,819 pounds.

These packages contained, not only drugs and medicines, but almost every imaginable article for use in hospital.

The entire list of issues includes hundreds of articles, but a few are mentioned here, merely to show the enormous quantities.

A few of the special issues during this period, were:

Aether, in 100-gm. tins .....	Tins. 14,500
Alcohol, in 1-liter bottles .....	Bott. 21,989
Ammon. chlor. troches .....	No. 976,800
Chloroform, in 100-gm. bottles .....	Bott. 17,267
Morphine sulph. hypod. tablets in tubes .....	Tubes 13,310
Oil ricini, in 1-liter bottles .....	Bott. 10,122
Pill cathartic comp. ....	No. 1,803,200
Quinine sulph. in 25-gm. bottles .....	Bott. 26,076
Quinine sulph. tablets .....	No. 25,900,500
Acid carbolic, crude, in 1-kilo bottles .....	Bott. 20,375
Lime chloride, in 500-gm. bottles .....	" 52,473
Beef extract, in 100-gm. tins .....	Tins, 45,924

Brandy, in 1-liter bottles.....	Bott.	20,632
Whiskey, in 1-liter bottles.....	"	27,235
First aid packets.....	No.	234,106
Plain gauze.....	Meters,	95,291
Muslin, unbleached.....	"	9,875
Rubber sheeting.....	"	10,232
Clinical thermometers.....	No.	8,249
Blankets, gray and white.....	"	45,327
Mattresses.....	"	11,108
Mosquito bars.....	"	15,893
Pillow cases.....	"	60,937
Sheets.....	"	83,802
Shirts.....	"	28,980
Pajamas.....	suits,	11,458
Towels.....	No.	125,380
Cots.....	No.	17,889
Condensed milk and cream.....	Tins,	28,696
Malted milk.....	Bott.	6,759
Ginger ale.....	Bott.	10,160

During this time the pressure on this Depot was so great that it was closed for but one day, and for a year, from the 16th of April, this was the only absence of the Officer in Charge from his desk.

One instance of special urgency:—At 12 o'clock noon, on Sunday, August 28th, 1898, an order was received, to ship to Montauk Point, four division hospitals complete, with a large lot of additional articles, and to get them there that day if possible. It was recognized at once as impossible to get the supplies to that point, 120 miles away, on the same day—the 28th,—but work was commenced, and at six o'clock on the evening of the 29th., the shipment was complete, and at four o'clock on the afternoon of the 30th. three hundred and nine packages, the four hospitals complete, were delivered to the Commanding Officer.

The amount of labor necessary to accomplish this result can be understood only by one on the ground. Each hospital must be complete in itself, and, as the allowance of medicines was comparatively small, the articles all had to be packed specially. After the packages were transferred to the Quartermaster for shipment they were carried in trucks to the pier, unloaded, loaded on lighter, which was towed to Long Island City, then unloaded, and

loaded on the cars—that is each package was handled five times.

An Officer in Charge of the Depot is a Disbursing Officer, by which the labors and responsibilities are increased as all the stores purchased through this Depot are paid for by him. The average disbursement, for all purposes, for the four years since the beginning of the Spanish War, have been over nine hundred thousand dollars per annum.

In my early days at the Depot I was advised that I should attend to all the duties of the office in one hour a day and that I had the 'loveliest detail' of the Medical Department, but I have had the experience, and assure you that the detail as officer in Charge of a Medical Supply Depot is no sinecure, but is one that requires constant attention, vigilance and ceaseless labor.

#### DISCUSSION.

MAJOR JAMES EVELYN PILCHER:—This paper is a most valuable contribution to military medicine in that it calls attention to a comparatively little appreciated but profoundly essential feature of medico-military work. It does not bring out, however, the peculiar difficulties connected with the conduct of medical supply work in the field. Early in the Spanish-American war, I became deeply impressed with the importance of this duty and when a choice of duties was allowed me in the 7th Army Corps, I selected the medical supply department as the field in which the opportunity of rendering the most valuable service seemed to be afforded. The subsequent creation of a great supply depot, beginning with a single room eighteen feet square and ending with four great warehouses,—one of them four stories high and a hundred and fifty feet square,—all within the brief period of seven months was a task to tax the strength of the strongest. When to the difficulty of the work itself was added the fact that no experienced clerical help such as is described in the paper of Colonel Brown, was available and that the Supply Officer was made also Ordnance Officer, and Depot Quartermaster for the medical department and Paymaster for the female nurses, of an Army Corps varying in strength from fifteen to thirty thousand men, it is evident that the burden became certainly a very considerable one. The difficulty of the work was made still greater by the two facts that in an army corps of volunteers, the medical officers had to be taught how to make requisitions and what to ask for on the one hand; and on the other hand it was soon found that the allowances of supply tables based on peace requirements

were entirely useless as a guide to the issues of active service. The only ray of light on the picture was the fact that neither the Surgeon General nor the Chief Surgeon placed any obstacles in the way of a liberal and generous conduct of the work. As a result of this freedom of action, ample supplies for the sick were always available for issue and, as far as is known, every organization in the Corps was abundantly supplied. To accomplish so great a task, however, demanded an amount of work, which may partly be comprehended when it is understood that for the issue of a similar number of supplies to a smaller number of men with a much smaller sick rate, there had been previous to the war three large supply depots all manned with numerous experienced clerks and laborers. This is but a brief suggestion of the work done by the Supply Depot under my command at Jacksonville and at Savannah,—doubtless others did fully as much,—and this kind of work was, it is believed, a very considerable factor in the efficiency of the medical service,—although apparently a factor which seems to have received altogether inadequate recognition. The importance of having ample supplies at hand for the care of the sick would certainly seem to be the equal if not the superior, of any other single factor in medico-military service

#### AN UNCLASSIFIED PHILIPPINE FEVER.

IN the Philippine Islands there are a great many varieties of fevers which are not, and probably never will be properly classified. While serving in the Cagayan Valley I saw a number of cases of a peculiar type which I have never been able to properly name. A person apparently in perfect health would suddenly be seized with violent pain in the abdomen over the region of the stomach; sometimes there would be slight vomiting, but never looseness of the bowels; the pulse was quick and very weak; the temperature was usually about 101 while every patient suffered from severe headache and seemed dazed; the extremities were always cold. All patients, who remained untreated, died within two or three hours, while those who were promptly treated, recovered but remained in a very weak state for several weeks. The treatment which I used with good results was simply a hypodermic injection of strychnia gr.  $\frac{1}{10}$ , warmth to the abdomen and extremities, and phenacetin for the headache. Quinine had apparently no effect.—MELVILLE A. HAYS, *Cont. Surg. U.S.A.*

THE TREATMENT OF ANTERIOR DISLOCATION OF  
THE SHOULDER WITH REPORT OF A CASE IN  
WHICH REDUCTION WAS PREVENTED  
BY THE DETACHED GREATER  
TUBEROSITY.

BY GEORGE TULLY VAUGHAN, M. D.,

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**D**ISLOCATION of the shoulder is such a common injury and its treatment so important in order to prevent serious disability that no apology is needed for inviting your attention to what might otherwise seem a trite and uninteresting subject. It is variously estimated that from 40 to 60 per cent of all dislocations are of the shoulder, and of these the large majority—according to Flower 75 per cent—belong to the *subcoracoid* variety. The other two varieties of anterior dislocation, the *intracoracoid* and *subclavicular* are very infrequent. In attempting reduction the following methods should be used and in the order given.

1. *Direct Reposition.* This is one of the oldest methods in use. The surgeon places his fingers beneath and to the inner side of the head of the humerus with his thumbs on the acromion process and attempts to press or pull the head of the bone into place. Anaesthesia may or may not be necessary. It often succeeds in recent cases with slight muscular contraction and with the head of the bone very slightly displaced.

2. *Extension and Counterextension.* This is also one of the oldest methods but one which I believe is not appreciated at its full value. My attention was especially attracted to this method by reading an article by Stimson about two years ago in which he reported ten cases successfully treated, and in no case was it necessary to continue the extension longer than six minutes.



Stimson advised the use of a canvas cot with a hole cut in it large enough to let the arm come through. The patient reclines on the cot with his arm projecting through the hole with a weight of about ten pounds attached to the wrist. The method was applied as follows in my cases:

With the patient in the dorsal position place a folded sheet in the axilla of the dislocated arm and let the ends extend diagonally across in front and behind, the opposite shoulder where they are held by an assistant. The surgeon flexes the forearm on the arm to relax the biceps, takes hold of the arm with both of his hands just above the elbow and makes gentle, steady traction, at first in the line of the displacement, but as the traction increases, the arm is carried away from the side to an angle of about 45 degrees. The traction is continued, not too strongly but just enough to make the muscles tense. An assistant should be ready to relieve the surgeon when he becomes tired, as he is apt to do in two or three minutes, and the change should be made without relaxing the traction on the arm. In a short time, from one to six minutes, you gain the confidence of the muscles by the gentle steady traction, the spasmodic contraction ceases, the muscles relax and the head of the bone slips into place.

While this method is one of the oldest in use for the reduction of dislocations of the shoulder, there are certain features which if not new, do not seem to be fully appreciated; namely, the importance of using traction with gentleness and persistence with no great degree of force, and of keeping this up for several minutes until the muscles are tired out.

It is doubtful if this method is of much value in old cases. I have tried it in only two old cases, one a subclavian dislocation of 18 days standing, in which a number of attempts at reduction had been made both by layman and physicians. I tried the traction method for ten minutes while the patient was under the influence of ether, without success, and reduction was finally effected by Kocher's method of manipulation. The other will be reported in the latter part of this paper.

This plan especially appeals to me and seems worthy of trial because: (a) It is free from pain; (b) it does not require anes-

thetia; (c) it is perfectly safe in recent cases; (d) it can be used by the general practitioner who may hesitate to attempt more complicated methods; (e) it does not lacerate or injure the tissues and thus interfere with the success of other methods which may be attempted; (f) it succeeds in the large majority of cases. During the last two years my assistants and myself at the Emergency and Georgetown University Hospitals have used this method in about fifteen cases of recent dislocation with only two failures.

*Kocher's Method.* This is probably the best method of manipulation and should be tried if direct reposition and extension and counter extension fail, but it is painful usually requiring anaesthesia, and in unskilled hands may result in considerable injury to the tissues. It consists of three steps: (a) flex the forearm of the affected side to a right angle with the arm, press the elbow to the side, and rotate the humerus outward by carrying the forearm around until it stands directly out from the side. Unless the humerus rotates outward without difficulty this method will fail. In some cases it may be made to rotate by making traction in the long axis of the arm, (b) Still holding the forearm at right angles to the body, bring the elbow forward or forward and slightly inward until the arm is horizontal. If the head of the bone does not slip into place during the second step, make (c) internal rotation by placing the hand on the opposite shoulder and lowering the elbow into position.

4. *Arthrotomy.* If the three methods given fail in spite of anaesthesia, the dislocation should be reduced by arthrotomy provided the circumstances permit the performance of an aseptic operation. The methods by using the foot, knee, or fist in the axilla are not to be recommended on account of the danger to the axillary vessels, to the circumflex and posterior thoracic nerves, and even to the bones themselves—the humerus or ribs. I have in two cases fractured the ribs of patients with a moderate degree of force—using the fist as a fulcrum in the axilla.

The following case shows the impossibility of reducing some cases of dislocation without arthrotomy.

J. R., white male, aged 60 years, farmer; native of Va., fell down a flight of stairs January 30, 1903, striking his left shoulder against the doorpost and causing a subcoracoid dislocation.

A physician was called and attempted reduction with the foot against the side, and by binding the arm to the side over a ball in the axilla, using anaesthesia but without success. March 21, two months after the injury he applied for relief as he knew there was something wrong with the shoulder. The deltoid was wasted, the acromion prominent, the shoulder joint stiff, and the patient suffered considerably from pain in the arm and hand. The head of the bone could be felt beneath the coracoid process. Under ether all methods were tried without success—direct reposition, extension and counterextension, Kocher's method, circumduction, extension upwards, and even with the foot in the axilla. The head of the humerus rotated outward in Kocher's manipulations but reduction could not be effected. An incision was made over the glenoid cavity from the anterior portion of the acromion process down the shaft of the humerus. Bony material was found occupying the glenoid cavity and was at first thought to be new bone, but after dissecting it out and examining the humerus, it was recognized as the detached greater tuberosity. The adhesions existed around the margin of the fragment, and the glenoid cavity beneath was found smooth and unchanged. Reduction was easily effected by pressure in the axilla with adduction of the arm.

The wound was closed without drainage. recovery was uneventful and the patient was discharged March 30, nine days after operation. The patient expressed great relief from removal of the pressure on the nerves in the axilla.

#### GUNSHOT INJURY OF THE CEREBRUM.

AT the last meeting of the Medical Society of the State of New York, Dr. John A. Wyeth related a case of gunshot wound in a man aged twenty-three. The bullet entered an inch to the right of the median line and an inch from the junction of the interparietal and frontoparietal sutures. At the time of the injury the wound was closed without attempt to extract the bullet. The accident was followed by mental impairment which was marked when the patient came into the hands of Dr. Wyeth five months later. He then located the bullet and drained the abscesses which had formed in the substance of the right anterior lobe, with the result of entire recovery and but slight mental impairment.

## SICK-BAY NOTES FROM THE BATTLESHIP "OREGON."

By CHARLES F. STOKES, M.D.

SURGEON IN THE UNITED STATES NAVY.

IT has often been said that Naval Surgeons at sea lead a life of professional monotony. When asked to write a paper for this meeting I concluded to select a few cases from my notes in the medical journal of this ship to show that while our material may not be as abundant as that falling into the hands of those serving on shore, yet it certainly is as varied.

The cases reported have been treated during the past six months, and while individually not remarkable they were very instructive and interesting to the writer from a diagnostic point of view in that modern clinical methods were employed to clear them up.

Cases 1 and 2 were patients ill with pneumonia. The right lower lobe and the left lower lobe were involved respectively. Creosote carbonate, one drachm as an initiative dose, with fifteen minims every two hours afterward was employed in their treatment. Both convalesced by lysis.

Case 3 was one of fracture of the base of the skull with extensive facial laceration. The patient was on duty in the steam launch, and in going into the landing an overhanging plank on a steamer struck him in the face, almost tearing away his nose and severely lacerating his face. The lacerated parts were brought together with catgut sutures and united aseptically with little disfigurement. He had serous oozing from the nares for two or three days, and later pronounced subconjunctival hemorrhage on the left side. His recovery was uneventful.

Case 4. Varioloid. A Japanese Mess attendant presented himself for treatment with a typical varioloid eruption. He was treated on board ship. No other cases followed.

Case 5. Typhoid fever. Type severe; profuse epistaxis. Treated on board ship. Recovery.

Case 6. *Filaria Sanguinis Hominis*. Hematuria and chyluria. *Filaria nocturna* demonstrated in the blood.

Case 7. Malarial Fever. Demonstration of the plasmodium in the blood.

Case 8. Tuberculosis. Tubercle bacilli demonstrated in the sputum.

Case 9. Fracture of the Tibia. Treated on board ship and sent to duty.

Case 10. Diphtheria. Sent to hospital where the diagnosis was confirmed in the laboratory.

The importance of blood, urinary and sputum examinations cannot be too strongly urged, especially on board ship where infective diseases are so apt to spread.

In the case of filaria reported above the diagnosis was made through repeated urinary examinations. Blood cells were first found and later the urine became typically chylous. The filaria was then sought for and found.

#### ROYAL ARMY HOSPITAL, LONDON.

A NEW military hospital has for some years been building on the Thames Embankment, and is now nearly completed.

It will be the military hospital for the London garrison. There will be 225 beds, of which 150 will be assigned for ordinary purposes, excluding venereal diseases, and 75 will be reserved in clinical wards for special cases. The professors of military surgery and tropical medicine of the Royal Army Medical College will be in charge of the surgical and medical divisions respectively, and will give clinical instruction to the medical officers attending the college. They will be assisted by officers who will perform duties similar to those of house officers in civil hospitals. Near the hospital will be built the Royal Army Medical College, which will contain class rooms and laboratory accommodation for pathology and bacteriology. These arrangements are part of the outcome of the radical reform of the army medical department, which resulted from the sensation produced by the so-called "hospital scandals" of the Boer War.—*Jour. Am. Med. Assn.*

## WOUNDS BY LEAD AND JACKETED BULLETS IN THE CUBAN INSURGENT WAR.

By EDUARDO CARLOS POËY, M.D. (BELLEVUE.)

LATE LIEUTENANT COLONEL AND BRIGADE SURGEON IN THE  
EJERCITO LIBERTADOR DE CUBA; RECENTLY ACTING AS-  
SISTANT SURGEON IN THE UNITED STATES ARMY  
AND CAPTAIN AND ASSISTANT SURGEON,  
OF UNITED STATES VOLUNTEERS.

**D**URING my two years experience with the Insurgent Army in Cuba, I had ample opportunities to note the wounds produced by the plain lead bullets (cal. 43,) the brass "jacketed" and the more modern steel-covered or Mauser and "Krag" bullets. I shall not attempt to describe the numerous other bullets as used in civilized and uncivilized warfare in this article.

First a simple description of each will be given followed by their effects on soft and hard parts in the human body and the treatment I was able to give in each case.

**LEAD BULLETS.**—The lead bullet of the Remington rifle is a caliber 43, more or less conical in shape and about  $1\frac{1}{4}$  of an inch long by a little less than half an inch in diameter. It does not vary in its effects within good striking power. I have seen men wounded at almost all distances by this bullet and found that there was no appreciable difference in its effects. No man wounded through the hard or soft parts, however slightly, had any further desire for fighting at the time. It always lacerates most horribly at its exit, and also at its entrance, the latter depending on whether it has struck any object of sufficient hardness, a rock or a tree, to change its original form. For this reason I consider a "ricochet" shot to be more dangerous than a straight one as in ninety-nine cases out of a hundred the bullet has lost its original shape before wounding, having "mushroomed" sufficiently to cause the worst wound possible. In target practice

(I believe) in the United States Army a "ricochet" shot does not count as much as a bullseye; something which I cannot understand, as in actual warfare, as far as my experience goes, its effects are worse than a straight shot. It was quite common to hear the Cuban soldiers say that, if they were to be shot they preferred a straight one to a "ricochet." I most decidedly agreed with them. I can not understand why this kind of shooting should not count as much as a bullseye; as the American soldier is directed to "shoot low." Certainly a "ricochet" bullet does more harm than any other kind and since the main object is to disable the enemy with as many badly wounded as possible; this kind of shooting is the best, in my opinion, and none can do it better than the 43 Spanish.

**BRASS-COVERED BULLET.**—This one is the ordinary 43 Spanish which is covered with a light jacket of brass which renders its caliber a little large and necessarily forced the Spaniards to enlarge the bore of their Remington carbines to fit the bullets. These were issued by the Spanish Government to their Guerillas or Irregular troops and exclusively used by them against the Cubans and later in Santiago against the American troops. I here mention that it was this bullet, which Spain said the Cubans were using and which is also the mis-named "explosive bullet" considered to contain dynamite or some other explosive. This effect is derived from the "mushrooming" of the lead core on striking which causes the brass to break into small pieces, sending them flying in all directions with terrific force. They were made in the Spanish Arsenals as can be proved by samples in my possession and when the Cubans captured such ammunition and rifles they very promptly returned the compliment.

Incidentally, I may here state that at the beginning of the Cuban Insurgent war the Cubans only had shot-guns. Ammunition was very scarce all through the war, especially at the commencement, so the Cubans used pebbles, bird and buck-shot and barb-wire in their shot-guns. In the latter case the wounds produced were not serious though he who received a load had no more desire to fight for that day. This depended on both the proximity of the recipient and the part of his anatomy injured.

As the ambushades of convoys were seldom more than 100 feet away, missing your man was practically an impossibility and generally two or three Spaniards received the load from one gun. Unless an eye was struck, no permanent injury resulted. This was the most humane bullet I know of and one that usually accomplished its object successfully. The only objector to these bullets were the Spanish Surgeons who had to spend two or three hours over each wounded picking out the wire. They certainly cursed the Cubans for the use of this variety of bullets though it was not choice but necessity that compelled its use. However, the use of the brass bullets by the Spaniards more than counter-balanced the barb-wire affair which was only used at the beginning of the war. These wire wounds generally became infected because of the filthy condition of the Spanish soldier's body and produced small superficial running sores which in a few days would heal up leaving small linear scars. Spanish soldiers who were later captured said the wire felt like a lot of needles on striking them though it very quickly passed off.

MAUSER BULLET.—These are small conical bullets about one and an eighth inches long by one quarter inch in diameter. The jacket is of nickled steel or other like hard combination of metals. The lead core sometimes does not thoroughly fill the jacket at its point in which case it tends to simulate the brass bullet in its explosive action. The smokeless powder used with it gives it a very great penetrating power and high velocity. It is from the high velocity that its humane qualities are derived because its rapidity tends to push out of its path all soft tissues and when any resisting substance is met it goes through it making, as a rule, a small round hole. Stone will not always deform it unless it be of a very hard variety, like granite. This is strikingly shown in the case of a Cuban Lieutenant Colonel who was wounded at the battle of "Maltiempo" in Matanzas Province. The wound of entrance was about two inches above the left clavicle and *directly* between the carotid artery and the jugular vein, the pneumogastric nerve was apparently uninjured. Its course was slightly downwards and backwards with its exit at the upper and external edge of the right scapula. I saw the case about six weeks



after the wound occurred and found only an almost invisible scar on the left side which looked more like a razor cut than a wound. The exit wound was still rose colored, slightly larger than the caliber and its edges somewhat raised. At that time there was slight paralysis of the right forearm and hand, showing that the median nerve had been injured temporarily. The officer could not give full details as to how the wound occurred, except that his tongue swelled and turned black and that he was unconscious for quite a long time. In four months he had recovered the full use of his forearm and hand. I can safely assert that had it been a lead bullet or a brass covered one, death would have been instantaneous. No one shot through such a part with either of the last mentioned bullets has ever lived, that is as far as my personal knowledge and experience goes in warfare, and I certainly have had enough of it, seeing that I participated in the Santiago, China and Philippine campaigns.

**EFFECTS.**—The ordinary 43 caliber always lacerates, even when striking soft tissues. It mushrooms on meeting the least resistance and in this condition its wounds are most horrible. The entrance wound is generally larger than its caliber and the exit, depending on what anatomical structures it has encountered in its path through the body, three or more times its caliber. Though not always fatal, the injury is permanent and the traumatic shock most terrific. In most cases, where bone is struck, an amputation or exsection is necessary. Hemorrhage is usually great and exceedingly troublesome. The arteries, veins, tissues, etc., are all badly torn to a horrifying degree. With the exception of the brass bullets and other uncivilized varieties, this one is the worst in use by so-called civilized nations.

The brass covered bullet is the ordinary 43 Spanish caliber which has a brass jacket. The strength of each metal being different, the lead on meeting resistance promptly spreads and breaks its coat of brass into numerous pieces which are sent flying in all directions with terrific force. This is the so-called "explosive bullet" which at one time was thought to contain dynamite or some such substance. The Spaniards accused the Cubans of using these bullets when in reality these were made in the Spanish

Arsenals and issued to the Spanish Guerilla forces by the Spanish Government. Its wound of entrance was generally larger than its caliber and its exit was worse than that of the plain lead bullet under its worst conditions. Judging from numerous wounds I saw, I believe that this breaking of the brass occurs after it has passed through a hard substance though but one case in my experience showed different action. This was of a man wounded through the right hand, the lead passing through leaving a piece of brass in between the unciform and os magnum, of the size of an American cent. I saw this case about a year after the wound occurred, which was thoroughly healed. The piece of metal protruded about one-quarter and one-eighth of an inch on the palmar and the dorsal surfaces respectively and caused annoyance only on closing the hand tight. The man being anxious to have it removed I laid him down on a mat and, with the help of an officer, had the patient's hand tightly held. I told him I had no anesthetic and with a small drink of "aguardiente" (sugar cane whiskey) I started in. The projecting brass of the palmar surface was grasped with a pair of wire nippers and with a good, strong and long pull the brass came out. It was more or less serrated and pentagonal in shape. On it there were evidences of bone formation. Though the operation was more or less brutal owing to the want of suitable instruments, the pain was not very great and after the proper dressings were used the man went back to his duties. No suppuration occurred. This case disposes of the absurd idea that brass will poison when in a wound. It is a well known fact that all Frenchmen have large quantities of copper in their liver because of the copper utensils used in cooking the food.

Another case of wounding by this brass bullet was that of a Cuban cavalryman at the battle of "Sabana de la Marina" in Puerto Principe Province. The wound of entrance was about one inch below the insertion of the patellar ligament of the right leg. The hole was perfectly round and slightly larger than its caliber. The edges elevated and swollen. On inspection of the exit the sight was sickening. The whole calf had been ripped off and lay on the heel. This force was transmitted to the trousers

and the socks which were also ripped off. The upper and posterior portion of the tibia had been blown off and a like portion of the fibula was badly and completely fractured. The surrounding tissue was so lacerated that an amputation was done above the knee with good results. The arteries and veins were shredded and bleeding profusely. No lead or brass was found in the vicinity of the wounds but an examination of the removed part showed numerous pieces of these imbedded in the soft tissues between the two bones, far down. With such a badly torn leg the man rode fully two miles before assistance could be rendered. His troop commander had tied a cord tightly above the knee before sending him to me.

While I only give two cases of wounds by this class of bullet still they may be taken as a general sample of the usual destructive action with very few exceptions.

The Mauser bullet is the most humane and the most useless from a military point of view. In the latter case I refer to the fact that unless it strikes a vital part, as the brain or heart, it does not stop a rush or a man's further fighting, when even seriously wounded as will be shown by two cases. It does not have an explosive effect unless the bullet has not been properly made, i. e., that the lead core does not thoroughly fill the jacket at the point which then becomes somewhat like the brass variety, allowing the jacket to flatten and become destructive. This Mauser bullet when properly made has a sharp pointed nose which bores through bone without fracturing it. The hole is perfectly round, smooth and clean. Its high velocity pushes out of its path all of the softer tissues and on emerging leaves a small round hole like the entrance wound. The wounds heal very rapidly and leave very small and almost invisible scars. In order for it to "mushroom" it must strike some very hard substance like granite stone. I have seen men wounded by a bullet that had passed through a palm tree and then through an arm or a leg with no fracture occurring, which showed that it needs a very hard substance to cause it to "mushroom."

The first case was that of a Cuban cavalryman who was shot through both thighs. The entrance wound was about one inch

below the greater trochanter of the right femur and, passing through the limb, it struck the lower left half of the scrotal sac, tearing it and also cutting the left testicle to half its core like an orange. Then it entered the left thigh, passing through the femur at about the same point as the entrance wound. The holes through the bones were clean cut and no fracture was evident. The man was on horseback at the time and very likely his scrotal sac was folded on itself which caused the tearing action. The cut of the testicle was as if made by a knife. When wounded the shock was not very great but rather mild, the man helping himself to mount another horse as his was killed while he was riding out of the fight. He was carried by his troop Sergeant on the front of the saddle for a distance of a mile or more before "first aid" could be rendered. The wounding occurred at a distance of less than 100 yards while charging on a Spanish square. On examination the wounds of the thighs were found clean holes and the testicular arteries were uninjured. A warm 1% solution of carbolic acid was used and the testicles washed clean. A dressing of carbolized gauze was wrapped around it and a loose bandage used. Orders were given to wash these parts twice daily with the warm solution while I went in search of instruments, chloroform, cat-gut and other necessities for operating. It was two weeks before I could get these things except the chloroform. However, with an occasional drink of Cuban whiskey in lieu of an anesthetic, the operation was performed satisfactorily. I scraped the sac and the testicle in order to have a bleeding surface and then put in a few stitches in the testicle. A warm solution of salt water was then used to wash the sac and which was then closed with cat gut. Gauze was wrapped around the sac moderately tight and then adhesive straps bound around it, the whole being well suspended and the patient told not to move any more than necessary. His bowels and bladder were attended daily. In a week the dressings were removed and the wound had almost united. Again the washing and dressing was repeated and left for another week. In less than a month he was discharged from the hospital as cured and sent home on a three months furlough. At no time did the thigh wounds give me any

trouble and I paid no attention to them, knowing from previous experience that clean wounds like these were better off if left to themselves. As to the final results concerning the cut testicle, I can not definitely state though from the fact that there was no atrophy inside of six months, I judged its procreative powers remained normal. Another strange point in this case was that the traumatic shock was nothing and the man was continually joking about the wound and begged me to save the testicle; saying, he had plenty of use for it in the near future.

The second case was a Captain of Infantry who, while assisting to remove a dead man from the field, was mortally wounded. A hasty examination was made by me but failed owing to the fact that I was under fire and the extraordinary apparent absence of any wound. When I was able to remove the officer to the rear and after fully ten minutes exploration I found the wound of entrance, a small speck of blood in the concha of the left ear which drew my attention to the spot. The symptoms were all of a head wound and when the speck of blood was found I gently passed in a probe and found a free passage into the brain as far as the sphenoidal bone where I thought I could detect the projecting rear of the bullet. The aural canal externally was uninjured and the membrana tympani was invisible, probably having been blown to pieces. No exit was found. A further search for other wounds resulted in finding two pin scratches in the fold of the left deltoid muscle. I passed the probe through and found a perfect wound. Very often, in loose tissue, a Mauser bullet will only make these pin-like wounds, that is if the general direction of the surface wounded be almost parallel to the flight of the bullet. I remember another case where a man was wounded through the fold of the cheek while laughing and only two scratches were visible. In the captain's case there was no apparent hemorrhage and he died in six hours without regaining consciousness. Owing to the objections by all Cubans to autopsies none was made in this case, so the exact location of the bullet was guess work on my part.

I heard of a case where a man was shot through the brain, the bullet entering about the centre of the frontal bone and

emerging at the occipital protuberance. For a time the man was badly paralyzed though he finally regained almost perfect control of his muscles.

Another case was that of a Colonel who was wounded by a Mauser bullet which entered the right orbit at the exit of the lachrymal canal and emerged to the right of the second cervical vertebra. The presence of a little blood in the right orbit gave the clue to the entrance wound. The sight of the right eye was lost but the left remained normal. In none of these cases were explosive effects noted and it can be laid down as a rule that seldom, if ever, will a Mauser bullet cause permanent injury, and the death rate produced by it is the smallest of any known bullet.

CONCLUSIONS.—From my experience in a long war service, I am convinced that the less surgical interference is allowed the better the results ultimately. In the treatment of Mauser and like constructed bullets, common sense and antiseptic treatment will do more for the patient than all the surgical operations possible. An exception is made in the brass covered bullet for reasons already noted and even then only in excepted cases. A fractured bone does not necessarily have to be excised or amputated. Many such cases were treated non-surgically in the Santiago campaign with the best results possible. Even a compound fracture does not require the removal of the part, in all cases. A comparison of the Civil War and Spanish-American medical records will plainly show that the surgeons of the former war were always too anxious to use the knife, to the detriment of the soldiers and "Uncle Sam's" pocket-book as seen by the pensions given for loss of limbs. I quite understand that the easiest way out of a possibly fractured limb is to amputate it as the recovery is quicker, but what of the patient? Even an ankylosed joint is better than no limb at all.

The Mauser bullet is the most humane, followed closely by the Krag. The worst is the brass one and from that down to the different projectiles used in uncivilized warfare. The "stopping" powers of the Mauser and Krag bullets are nil, the contrary holding good with the others mentioned. In the Philippines a Private of Co. "F," 21st Infantry, was badly "boloed" in a hand to hand fight with Filipinos in the Cañon of the Malaquintubic River near Bat-

angas town. This soldier had shot through the body of his enemy three times and still the latter was able to give the soldier seven serious "bolo" wounds, one of which nearly severed the neck vessels. Not until another soldier with fixed bayonet ripped open the Filipino's thorax was the latter vanquished. Another case in point was that of Lieutenant Patrick A. Connolly commanding this company who was also "boloed" in the same fight by a small sized Filipino who though shot twice by the Lieutenant was still able to cut the officer's face very badly and also four fingers of his right hand. Not until they both fell into the river was the officer able to kill his man by forcibly holding the native under the water, which was about three feet deep, and hammering him on the head with the butt of his 38 U. S. Colt. (Incidentally, this is the only authorized military "water-cure" permissible in the U. S. Army.)

Both the Mauser and Krag must hit a very vital part to stop a man from further fighting. In this connection I will cite a very interesting case of a Cuban Major who was wounded by a Mauser bullet at a distance of less than 300 yards. The entrance was one inch to the left of the sternum and between the third and fourth ribs. There was no exit but the bullet was found under the inferior angle of the left scapula just beneath the skin. I could easily grasp and twirl it around and its shape and size coincided with a Mauser bullet with which I compared it. The entrance wound was like that made by a brass one. I endeavored to remove it but was not allowed by the patient who stated that he wanted it as proof when later in life he would tell how he was shot through the heart. I examined his thorax and found his heart in the normal position, on the left of the sternum. This only shows the humanity of this bullet. Had it been a lead or brass covered, death would have followed rapidly. The strange part is that this case recovered entirely in less than three weeks though he was the most seriously wounded I had. Nothing but the usual antiseptic treatment was given and at the end of three weeks I discharged him as cured with a three months furlough. The Surgeons in the Cuban Army were authorized to grant furloughs without asking anyone's permission, as is required by the "réd-

tape" of the U. S. Army. The Cuban Surgeons were trusted to do their duty honestly and I never heard of one mis-using this trust.

Prompt "first aid" will do better than all the surgical interference known. Under "first aid" the writer includes such procedure as tying an artery "splinting" a fracture, etc., and such immediate attention as a case might require under ordinary circumstances. The Santiago campaign showed plainly the value of such treatment. Nor are exploratory operations always necessary in the field where absolute asepsis is utterly impossible, even in the best conducted field hospital. No Surgeon, who had any experience in Santiago and the Philippines, will deny this statement, while many will certify that the wounded sent to the United States, having only received "first aid," had aseptic wounds, even in badly shot cases. To further explain my position I will cite a case of serious abdominal wound with exceedingly happy results with this treatment, so far as it lay in my power.

A Cuban Major of Infantry was wounded by a Mauser bullet which entered about six inches to the right and on the level with the umbilicus and making its exit at about the same point on the left side. At once "first aid" was given and the officer removed to the Hospital. Milk only was prescribed as diet and a daily washing of the wound externally, with a very mild solution of carbolic acid (none other at hand), followed by a salt solution was all that was done. The patient was in the third week of recovery when I was ordered to join my troops. I left instructions not to give the patient any other treatment or food, nor to allow any one to visit him. During my absence the officer's wife, unknown to the steward in charge, gave her husband sweet-potatoes and chicken and of which he ate in abundance. Three hours later the officer was dying and before I could arrive had died. Death I ascribed to rupture of the weakened intestines from dilatation produced by the sweet-potatoes which decompose rapidly in the intestines with production of gas. No autopsy was made but I felt sure that the bullet had only cut through the serous and, partially the muscular coats of whatever intestines it had injured. No symptoms of perforation had been present at any time and the



fact that all Cubans, as a rule, would fast before a coming fight, in order to avoid any intestinal matter passing into the peritoneal cavity in case of a wound, may have had something to do with this case. Certainly a non-dilated intestine is less apt to suffer injury from a Mauser bullet, whose property is to push out of its path any loose tissue. At any rate, too many cases have come to my notice not to believe that there is something in this fact. Men shot through the stomach and intestines have pulled through without operations, who had they been operated would have in all probability died. The bullets are generally clean and very likely rendered aseptic by the excessive heat of the smokeless powder used. This may be the reason why Mauser wounds seldom show infection. The less surgical interference is allowed in Mauser wounds the better the results. For my part, I hope, that, if ever I am wounded, it will be by a Mauser bullet, for I feel certain, that, even in a serious wound the chances for absolute recovery are fully 95 per cent.

#### SHOWER-BATHS IN THE SPANISH ARMY.

THE warm shower-bath would seem to be something of a novelty, or at least a luxury, in Spain, if we may judge from an article (*Revista de Sanidad Militar*), in which C. Navarro y Vicente speaks with enthusiasm of a public shower-bath establishment he recently saw in Paris, points out the extent to which shower-baths have been installed of late years in certain French and German cities—especially in German barracks—goes into an historical account of bathing in the armies of antiquity and of the middle ages, and ends up with the surprising recommendation that as Spain is too poor to supply her soldiers with warm shower-baths, and the only alternative being cold baths or no bath at all, and as "nobody attaches any value to anything he doesn't have to pay for," the soldier be made to pay for his bath.—C. N. BARNEY.

## TRAUMATIC RUPTURE OF THE CHOROID,—REPORT OF A CASE.

BY LIEUTENANT EDWARD STIEREN,  
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**W**HILE engaged in playing base ball in Camp Perchmont, Somerset, Pa., during the annual encampment of the Second Brigade, N.G.P., Lloyd W. Price, aet. 21, by occupation a clerk in civil life, a private in Co. K, Eighteenth Regiment of Infantry N.G.P., was fairly struck in the right eye by a pitched ball, August 18th, 1902. The force of the blow stunned and rendered him unconscious for a few minutes. Upon regaining consciousness the eye was found to be totally blind, light perception only remaining; intense pain with marked photophobia increased the patient's mental condition, believing he had lost the sight of the eye.

Examination revealed a profuse hemorrhage under the ocular conjunctiva; a hemorrhage completely filled the anterior chamber, with exquisite pain on pressure. Tension normal. Movements of the eye-ball undisturbed.

The patient was immediately put to bed in the regimental hospital, continuous hot stupes applied to the eye and a 1% solution of atropin. sulphat. instilled into the eye every hour for the first eight hours. He received in addition to the local treatment, small divided doses of calomel and compound jalap powder internally and a hypodermic injection of pilocarpin. muriat., one-eighth grain, repeated in six hours.

Twenty-four hours later the hemorrhage in the anterior chamber was found to be markedly absorbed, the pupil fairly well dilated and the eye at rest. Vision had correspondingly recovered so that the patient was able to see movements of the hand at 18 inches. No fundus reflex could be obtained with the ophthalmoscope on account of cloudiness of the vitreous from hemorrhage into the same.

Treatment was continued until the evening of the second day when the pilocarpine was discontinued and drachm doses of Rochelle salts supplanted the calomel and jalap. The hot applications were continuous and the interval between instillations of atropia lengthened to two hours.

On the morning of August 20th, patient was able to count fingers at twelve inches; the hyphaemia into the anterior chamber was entirely absorbed and the pupil dilated ad maximum. A clear picture of the fundus could not be obtained as the vitreous still remained quite translucent. Atropia was reduced to three times daily, and the patient given a thorough diaphoresis with pilocarpine and a hot foot bath.

The vision continued to improve steadily, and on August 22d, a fairly good view of the fundus could be obtained when the diagnosis of the rupture of the choroid was established. The rupture occurred between the disc and the macula, presenting the form of a crescent with its concavity toward the disc. It was quite long, about two papilla diameters in length, about one-half papilla diameter wide at its center, tapering at each end. The margins of the rupture were moderately pigmented. The pigmentation subsequently absorbed; two months later not a vestige of it remained.

The patient made an uneventful recovery even before camp broke. He was seen from time to time after returning to civil life, and suffered no permanent injury to his eye other than a positive scotoma corresponding to the cleft in the choroid. Central vision was unimpaired and remained  $\frac{3}{8}$  for six months afterwards, up to the last time the patient was seen.

Too much stress cannot be given the importance of prompt and energetic treatment in cases of sudden blindness following an injury of this nature. With the lesion obscured by the hemorrhage into the vitreous and anterior chamber the diagnosis of rupture of the choroid cannot be made with certainty until the media have cleared sufficiently to allow an ophthalmoscopic examination.

The treatment should therefore have for its objects, 1st. to keep the eye at rest; 2d, to allay pain; 3d, to check inflammation; and 4th, to favor the absorption of the hemorrhage.

## THE SANITARY ORGANIZATION OF THE RUSSIAN ARMY.\*

By LIEUT. COL. JOHN VAN RENSSELAER HOFF,  
MEDICAL DEPARTMENT, UNITED STATES ARMY.

THE sanitary organization of the Russian Army is based upon the regimental hospital, each fighting unit (battalion) having its own sanitary personnel, appliances and transport. Upon this, in active service, is engrafted a divisional organization following the lines of modern military sanitation. The sanitary personnel, the surgeons, have no military rank; they belong to a class designated "official," which includes all persons not actually fighting men, and they are considered as civilians attached. In common with all other Government officials, they have a standing according to their rank in the "chin."

All Russian military officials are known technically as "Voyennii Klassnii Chinovniki," and belong to one or other of the following classes: Chaplains, intendance officials, surgeons, veterinarians, apothecaries, officials of the various military educational establishments, etc. In these groups there are no special names for grades, which are only denoted by the particular class-rank in the "chin" which the individual official has, and which is, in effect, a social or court standing. For example all surgeons are designated "vrachi," yet they have rank in the "chin," from the third class to the ninth class, the highest medical official having third class, and the lowest (Junior Surgeon) ninth class rank. The highest apothecary official ranks with the fifth class, etc. All surgeons wear a uniform of dark green cloth, the coat (tunic) having cuffs and collar, of the same color, piped with scarlet. The shoulderknots are narrower than those of com-

\*From a paper on The Sanitary Organization of Some of the Great Armies of the World in the *Proceedings of the Association of Military Surgeons*, Vol. V.

batant officers, and are ornamented with silver lace. The trousers are dark green in color, without stripe, and the undress cap is of the same color, with a dark green band and red piping. The subordinate personnel wear the same uniform as the regiment to which their hospital belongs.

The organization of the personnel of the Medical Department of the Russian Army is as follows:

I.—Chief Medical Department:

1 Chief Surgeon, 1 Assistant, 1 Chief Inspector, 4 Principal Officials, (Surgeon, Veterinarian, Pharmacist, and Professor Oculist), 13 Surgeons, 1 Pharmacist, 18 Minor officials, 45 Clerks, and 4 Couriers.

In addition to the foregoing the Department has at its disposal:  
5 Surgeons, 15 Pharmacists, 15 Veterinarians, and 28 Junior "Feldshers." \*

II.—Military Districts and Staff.

a. District Military Medical Department:

1 Chief, 1 District Medical Inspector, 1-2 Assistants (Surgeon and Pharmacist), 1 Oculist Surgeon and 1 Veterinarian, 1 Surgeon and 1 Pharmacist, as Secretaries, and an indefinite number of "Feldshers" and Clerks.

b. Staff of Army Corps:

1 Corps Surgeon and 1 "Feldsher."

c. Staff of Infantry or Cavalry Division.

1 Division Surgeon.

d. Staff of Field and Reserve Artillery Brigade:

2 Surgeons, 1 Veterinarian, and 7 "Feldshers."

e. Staff of Sapper and Railway Brigade.

1 Surgeon.

III.—In the Line:

a. In a regiment of Infantry, consisting of 4 battalions, there are 1 Senior and 4 Junior Surgeons ("vrachi"), 1 Senior and 12 Junior Dressers ("Feldshers"), 1 Compounder ("Abtechnii feldsher"), 14 Dresser pupils, 1 Hospital Sergeant ("Nadziratri Volriki"), and 3 Hospital Orderlies.

All these are classed as non-combatants.

The average strength of an infantry battalion is about 1,000 of all ranks; and the combatant companies, in a 4-battalion regi-

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\*"Feldshers" correspond in their duties to the Hospital Corps, U. S. Army.

ment are numbered from 1 to 16. All of the non-combatant officials in a regiment are grouped into what is called a non-combatant company, which is not numbered. The medical personnel allotted to other fighting units is in proportion to strength, based upon the requirements of an infantry regiment. A cavalry regiment has usually a strength of from 777 to 1,000 men, depending upon the number of squadrons (four or six). The artillery is organized into brigades of six battalions each, the average strength being 1,100 of all ranks in each brigade, etc.

*b.* A Cavalry Regiment (4 Squadrons) has:

1 Senior and 1 Junior Surgeon, 1 Veterinarian, 6 "Feldshers," (in 4-Squadron Regiment, 7) 4 Veterinary "Feldshers," 2 "Feldsher" pupils, 1 Supervisor of Sick (non-commissioned officer), and 2 Hospital Attendants.

*c.* Of the Artillery:

A Foot Battery has 2 "Feldshers," 1 "Feldsher" pupil, 1 Hospital Attendant. A Horse Battery the same as a Foot Battery. A Mortar Battery 4 "Feldshers" and 1 Hospital Attendant, and the Artillery Parks (Flying and Movable), each, 1 Surgeon and (?) "Feldshers," etc.

*d.* A Sapper Battalion has:

1 Surgeon, 7 "Feldshers," 5 "Feldsher" pupils, and 2 Hospital Attendants.

*e.* Reserve Infantry Battalion (4 companies) has:

1 Surgeon, 1 Junior Surgeon, 7 "Feldshers," and 5 "Feldsher" pupils, and

*f.* A Fortress Infantry Battalion the same.

*g.* A Depot Cavalry force ("Cadre") has:

1 Junior Surgeon, 1 Veterinarian, 4 "Feldshers," 4 Veterinarian "Feldshers," 2 Hospital Attendants, etc.

The material, tentage, etc., of the regimental hospital, which always accompanies the fighting organization to which it belongs, is transported in four one-horse medical store carts. Besides these there are four four-horse ambulance wagons, and a two-horse wagon to carry thirty-two stretchers (two per company). In peace or war these regimental medical units are completely organized and the personnel is identical, except that the fourteen "Feldsher" pupils are replaced by eight additional Junior "Feldshers," and the capacity of the hospital is extended from sixteen to eighty-four beds (twenty-one to each battalion of a thousand strong).

Each "Feldsher" carries a knapsack containing dressing materials. In addition to the "Feldshers," there are detailed from each company six men who are specially trained as bearers. A four-battalion regiment, sixteen companies, each of two hundred and fifty men, furnishes ninety-six bearers from the combatant strength; these men wear the arm-band of the Geneva Convention only when actually employed in bearer work.

During an action the regimental medical personnel form collecting stations, to which the wounded are carried. But the regimental hospitals are ordinarily not pitched, except at the time the regiment goes into camp.

During active service the various medical units, required on mobilization, are organized from the regimental peace establishment, supplemented by men from the reserve, the drivers coming from the cavalry reserve,

These units are in addition to the regimental medical organization, and are as follows, viz:

*A. Sanitary Division:*

To each infantry division in the field is attached what is called a "Sanitary Division," and this forms a part of the divisional, supply, and transport column. The Sanitary Division consists of a bearer company, a divisional ambulance hospital, and two "Mobile" field hospitals. In the case of sanitary divisions attached to active, as distinguished from reserve infantry divisions, two extra "Mobile" hospitals are included, making four in all for that division. The divisional sanitary organization is intended for the establishment of a main dressing station, and to otherwise collect and dispatch the wounded from the fighting line to the field hospitals. The personnel consists of:

- 1 Officer (combatant) commanding.
- 5 Surgeons.
- 1 Official (Quartermaster).
- 29 "Feldshers," etc.
- 217 Non-Commissioned Officers and men of the Bearer Company.
- 39 Non-Commissioned Officers and men of the Transport Corps.
- Total, 292.

The equipment consists of fifty stretchers, two thousand bandages (divided in ten packages), fifty first-aid knapsacks, the nec-

essary medicines, stores, etc., two operating tables, and four dressing tents. The transport comprises eight four-horse ambulance wagons, three one-horse medical store carts, fifteen two-horse store wagons, and one four-horse store wagon (for heavier parts of material).

Longmore gives a somewhat different organization. According to him the personnel of the Sanitary Division consists of :

Field hospital (to accommodate six officers and 160 men) :

Eight Surgeons, sixteen Dressers, fifty Orderlies, with the necessary (?) officials..

Bearer Company: One officer, one Sergeant-Major, eight Sergeants, and 200 bearers.

Transport Section: One officer, and 108 drivers.

Total, 393.

With the divisional sanitary train are: Twenty-four ambulance wagons, an equal number of store wagons, six stretcher carts, two medical store carts. Each train carries 144 stretchers.

The organization of the bearer company is practically identical with that of the other companies; the uniform is the same as that worn by the 1st Regiment of the division to which it belongs, and the number of the division is shown on the shoulder-loop. The brassard of the Geneva Convention is worn, and no arms carried except by the drivers, each of whom has a hatchet, and who do not wear the brassard.

*B.* The Divisional "Mobile" (field) Hospitals constitute the third line of medical assistance, and each affords accommodation for ten officers and 200 men. Their rôle, location, and movements are the same as in other armies. The personnel of these hospitals consists of: Two Surgeons, two other officers, 107 non-commissioned officers and men (including twenty-eight for transport duties), four Sisters of Mercy, fifty-seven horses, and twenty-five wagons.

The equipment includes bedding and clothing for ten officers and 200 men:

210 bedsteads.

105 tables.

40 stretchers.

3 large tents, each to hold 20 men, and the necessary medical stores food, etc.



The transport comprises:

- 19 two-horse store wagons.
- 1 four-horse wagon for heavy parts of tents.
- 4 one-horse store carts.
- 1 four-horse carriage for the Sisters.

The uniform of the personnel of these hospitals is the same as that of the 4th Regiment of the division, with the number of the hospital on the shoulder-loop. The arms and the use of the brassard are the same as described for a bearer company.

During a battle the divisional "Mobile" hospitals are established somewhere in rear of the line of battle. In addition to their permanent personnel, when necessary, Surgeons and Dressers are detailed from the regiments in sufficient number to meet the requirements of any particular emergency.

The divisional ambulance hospital constitutes the dressing station, which is located in the immediate rear of the fighting line. Its personnel is furnished by detail from the regimental Surgeons and the Bearer Company.

C.\* The Reserve Field Hospitals, of which two hundred and forty are maintained, and in war are established at points on the line of communication. They have no transportation, their personnel and stores being forwarded by rail, boat, or by requisitioned transport. Each has:

- 5 Surgeons.
- 4 Officials.
- 80 "Feldshers," etc.
- 4 Sisters of Mercy.

Their organization is identical with that of the divisional field hospitals, except as to transport.

D. The Military Sanitary Convoys, twenty in number, are

\*Longmore says that in European Russia these hospitals number eighty four, and are permanent formations. In time of war they follow a few marches in rear of the army. Each field hospital will accommodate thirty officers and 600 men, and can be divided into three equal sections. The personnel consists of one Commandant (non-medical), one Principal Surgeon, nine Surgeons, one Apothecary, two Compounders, 304 non-commissioned officers and men, of whom sixty-three belong to the transport service.

Each hospital has a train of twenty-seven carriages, which may also be employed to transport the sick to the hospitals further in rear. Both material and hospital stores are kept, in time of peace, in the intendant depots. The personnel and horses are organized only during active service.

mobilized in time of war for the transport of wounded and sick from the front to the rear. The strength of each is one combatant officer in command, two surgeons, ninety-eight non-commissioned officers and men (including seventy-one for transport work), two Sisters of Mercy, 137 horses, and thirty-six carriages, including twenty-seven four-horse ambulances, one four-horse kitchen wagon, seven two-horse store wagons, and one one-horse medical store cart.

*E.* The Field Dispensaries are intended to supply the divisional and field hospitals with the medical and surgical stores they require. In time of war seven of these dispensaries are mobilized, each is provided with a supply equal to the requirements of four months, and has a personnel of three officials and twenty-one non-commissioned officers and men. Transport is provided when required. According to Longmore, twenty-eight store wagons are attached to each field dispensary, some of which follow the army in advance and others are distributed between the base and other points.

*F.* There are seventeen Permanent Military Hospitals located in European Russia, eleven in Caucasus, and six in Asia, —divided into four classes, as follows:

PERSONNEL	1st Class. 200 Beds.	2d Class. 400 Beds.	3d Class. 650 Beds.	4th Class. 1100 Beds.
Chief .....	1	1	1	1
Surgeons .....	4	7	10	18
Officer .....	.	...	...	1
Officials .....	4	5	8	10
Apothecary .....	1	1	1	1
"Feldshers" .....	8	13	20	33
Lower Grades .....	76	114	152	233

*G.* Local Hospitals. There are also in Europe about sixty, in Caucasus about forty, and in Asia about sixty, of from 50 to 350 beds each. Their personnel consists of two to seven surgeons, one to two apothecaries, one hospital supervisor, three to eleven "feldshers," seven to twenty-seven lower grades, and one nurse for each eight patients.

*H.* In every independent unit or command there is a Troop Hospital, which is to be opened when no military or local hospitals are available. Instead of troop hospitals, receiving rooms of six-

teen beds may be opened in each command. The personnel of these troop hospitals is determined by the regulations governing the sanitary service, as already described under "III. In the Line," for each regiment, battery, etc.

*I. The Medical Depots*, of which the central medical depot is at St. Petersburg, and nine other military medical depots are established at different points in the Empire, are for the purchase, storage, and issuing of supplies.

Longmore says that all temporary hospitals are under the orders of the Director-General, who is attached to the General Staff of the army. Whether or not he be a physician does not appear—probably not, inasmuch as Longmore furthermore says that the Director-General is assisted in his duties by the Chief Surgeon, as regards the medical details, and that the personnel of the hospitals are under his orders, except the surgeons, who are, however, subordinate to him in matters of discipline and administration. It is part of the duty of the Director-General, in active service, to see that all hospitals at the front are evacuated as rapidly as possible, in accomplishing which, if the ordinary means of conveyance should be insufficient, recourse can be had to the wagons of the Intendance or of the country in which operations are being carried on. It is also his duty to establish new field hospitals and, generally, to control the supply, and see to the efficiency of all military sanitary establishments. He receives his orders from the Chief of the General Staff, and is in immediate communication with the Minister of War regarding medical supplies, etc.

The present total of the Medical Department of the Russian Army does not materially differ from that of 1886, which was:—

2,808 Surgeons,  
232 Pharmacists,  
3,804 Medical "Feldshers,"  
3,455 Company (squadron, battery) "Feldshers,"

and which may be said to represent the peace establishment of the Russian Military Sanitary Organization.

## ANOTHER VIEW OF THE RADICAL OPERATION FOR INGUINAL ADENITIS FROM A NAVY STANDPOINT.

By PAUL E. McDONNOLD, M. D.

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**I**N the April, 1904 number of the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS there appeared an article entitled "A Plea for Early Radical Treatment in Adenitis Inguinalis." Ten cases were presented, apparently to show the advantage of this method of treatment. From the date of the operation to the date of the discharge of the patient these cases had a total of 152 sick days, an average of 15.2 days each. Excluding the four cases operated upon after suppuration had taken place there was an average of 7.5 sick days each.

I wish to call attention to the result of treatment, by the non-radical plan, of fifteen cases occurring aboard the U. S. S. Olympia during the last two years. These were cases which for various reasons were not transferred to hospital for operation or operated upon aboard ship. No special plan of treatment was used. Various applications were made, the object of which was to abort the inflammation, if possible, and this failing, to hasten suppuration. All of these cases were well marked and were the result of gonorrhoeal or chancroidal infection. Eight of the cases did not require operation of any kind, the inflammation subsiding without suppuration or softening.

It will be seen that there was a total number of 70 sick days, an average of 4.7 each. This does not mean that these cases were well when discharged to duty, but it does mean that they were able to perform duty without discomfort. I did not in any case compel a man to go to duty against his will or when I thought he would suffer thereby. Nor did I fail to put a man on the sick list when he complained of serious discomfort. It is only during the height of the inflammation in these cases that there is any great amount of pain and it is only during this period that I have

found it necessary to admit cases to the sick list. As soon as suppuration takes place and an incision is made there is only a slight soreness which remains.

PATIENT.	DATE OF ADMISSION.	DATE OF DISCHARGE.	SICK DAYS
1. H. E. B.	January 31, 1903.	February 11, 1903.	11 days
2. T. B.	Oct. 17, 1903.	Oct 28, 1903.	11 "
3. H. F.	May 11, 1903.	May 12, 1903.	1 "
4. Y. I.	Dec. 26, 1903.	January 4, 1904.	9 "
5. W. K.	February 20, 1903.	March 3, 1903.	11 "
6. W. F. M.	January 19, 1903.	January 31, 1903.	12 "
7. J. M. M.	February 5, 1903.	February 12, 1903.	7 "
8. A. G. S.	February 12, 1903.	February 16, 1903.	4 "
9. A. O. Z.	March 7, 1903.	March 11, 1903.	4 "
10. M. L.	Not admitted.		
11. G. L. M.	" "		
12. N. J. W.	" "		
13. O. K.	" "		
14. J. V.	" "		
15. W. K.	" "		
Total sick days 70.			Average 4.67.

A point which I think is overlooked in the consideration of these cases is the fact that many of the buboes resulting from gonorrhoeal and chancroidal infection can be aborted. As I have stated, eight out of the fifteen cases which I have reported subsided without requiring an incision. In such instances the patient escapes the future embarrassment of a scar, which is a matter of great importance to him. To have to explain the cause of a scar in this situation to a future wife (or to a present one, as often happens) must be no easy matter.

It depends altogether from what standpoint this question is viewed as to the treatment which should be carried out. In a hospital I would be inclined to operate upon all cases, believing that this offers the quickest cure, but on board ship where the patient can be treated daily and at the same attend to his duties, excepting the short time during the height of the inflammation, I certainly believe that the non-radical plan of treatment is much the best. It deprives the government of the patient's services for the least amount of time and at the same time gives the patient his chance to escape disfigurement. This chance is obtained at the cost of a slight amount of discomfort but absolutely without danger. I feel sure that if the patient were explained the situation and his opinion asked, he would always vote against the operation.

## THE KAHUNAS—WITCH DOCTORS OR SORCERERS— OF THE HAWAIIAN ISLANDS.

BY LIEUTENANT COLONEL BLAIR D. TAYLOR,

DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY.

**B**EFORE beginning a specific account of these peculiar people, it seems necessary to give a brief sketch of Hawaiian theology, which is the base upon which the superstructure of Kahunism is reared.

The Hawaiians of old believed in four principal Gods, in common with their Polynesian ancestors, and even to-day, among the Christian natives there is a leaven of superstition hard to eradicate.

The Gods in chief were:—

First—KANE—the originator and reckoned as the most powerful.

Second—KANALOA—the younger brother of Kane. A beneficent being believed to have introduced springs of water, bananas and other useful plants.

Third—KU—This God is apparently the Hawaiian devil. He is pictured as a wicked and revengful being, delighting in the misfortunes and sufferings of humanity, to which he was believed to be the principal contributor.

Fourth—LONO—a kind and gentle divinity to whom human sacrifices were never offered—as to Ku. He had separate priests and temples, was invoked for rain and believed *to be generally benevolent*.

Besides the four principal Gods there was a great tendency to multiply others. Many were deified animals as, the Lizard God—"MOO"; the Shark God—"UKANIPO"; the Owl God—"KUKAUAAHI". Strange to say, the presence of the owl was looked upon, not as a *bad*, but as a *good* omen.

In addition to these, there were numerous local Deities—the

principal among whom was the Goddess PELE of volcanoes and her family. The personal Gods of families known as AUMAKUAS or AKUAS, were frequently the spirits of deceased or deified ancestors and often occupied the bodies of some animal which was then "TABU" for that particular household. The AKUAS were believed to cause sickness, misfortune and death, when offended; therefore one of the principal functions of the Kahuna was to placate by proper incantations and sacrifices, the incensed Deity or to overcome his influence by engaging in his own service, a more powerful demon. The non-fulfillment of a vow was considered the most unpardonable sin against the family AKUA. The Hawaiians believed that each person had two spirits; one of which always remained in the body, while the other frequently wandered forth. Death, misfortune and disease, or the reverse were indicated by the appearance of this *double* when seen by others as will be mentioned later on.

To illustrate the varied opportunities presenting themselves to the KAHUNAS for practicing upon the credulity and religious fears of a superstitious people, the following extract from Alexander's "History of the Hawaiian People," concerning the "TABU SYSTEM" is submitted as showing how impossible it was not to commit a crime of some kind under such varied and stringent regulations:

"The 'Tabu' was a complicated system, which covered the entire daily life of the people with a vast network of regulations and penalties. These were not merely laws but religious ordinances and the violation of them was not merely a crime, but a sin, which would bring down the vengeance of the Gods. Some tabus were permanent and others special and temporary. Of the former kind were those relating to the Chiefs or to the idols or temples, while others belonged to particular times or were imposed by the King. The most oppressive of these regulations were those relating to the sexes. It was "tabu" for men and women to eat together or even to have their food cooked in the same oven. A complete domestic establishment comprised at least six houses: First a chapel for the family idols; second, the *mua* or men's eating house, which was tabu to females; third, the hale noa or common sleeping house; fourth, the hale aina or women's eating house; fifth, the hale kua, or house for beating

*tapa*\* and sixth the hale pea, for the women during certain tabu periods.

"The first two houses were tabu to women on pain of death. Several kinds of food were forbidden to the women on pain of death, viz., pork, bananas, cocoanuts, turtles and certain kinds of fish. These laws were rigerously enforced. For example, at Honaunau, Hawaii, two young girls of the highest rank, Kapiolani and Keoua, having been detected in the act of eating a banana, their Kahu or tutor, was held responsible and put to death by drowning. Shortly before the abolition of the tabus—1819—a little child had one of its eyes scooped out for the same offence. About the same time a woman was put to death for entering the eating house of her husband, although she was tipsy at the time. There were many tabus that related to ceremonial purity, especially in connection with funeral rites. There were many occasions when no canoe could be launched, no fire lighted, no tapa beaten or poi pounded and no sound could be uttered on pain of death, when even the dogs had to be muzzled and the fowls were shut up in calabashes for twenty-four hours at a time."

The belief, as said before, that all forms of sickness, disease, and misfortune were caused by evil spirits and that these spirits could be communicated with through the Kahuna, was strongly planted in the hearts of all Hawaiians from the king on his throne to the fisherman in his hut. The Kahuna was also feared by the Priests as well. They were supposed to have the power of "praying people to death," which is believed even to this day. To accomplish this purpose it was necessary for the Kahuna to have in his possession a lock of hair, paring of a nail or saliva taken from the prospective victim. Kings, therefore, surrounded themselves with faithful followers whose duty it was to collect and destroy these dangerous articles. One of the most prominent offices of Hawaiian chiefs was that of "spittoon bearer" and I was told by one of the intimates of the last King—Kalakaua—that while apparently a civilized and Christian sovereign, he was still deeply imbued with the old superstitions. During the last year when the present Governor of the Territory was sick and had gone to the Island of Hawaii for his health, it was freely pre-

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\*Cloth made of mulberry bark.



dicted by some of his native opponents that he would never return alive as he was being "prayed to death." He is; however, alive and well. A Kahuna generally inherits his powers and the occult gift is handed down in certain families. A prominent half-white Hawaiian told me that a Kahuna had stated to him, that in order to become an adept, one would have to achieve the difficult task of "praying to death" his wife, father, mother, son, daughter, or some very near relation.

It was customary for this malevolent purpose, to meet his victim occasionally, after having informed him that he was being prayed to death, and inquire how he felt and if he had any appetite, also stating that he had seen his *houka* or wraith with its eyes shut and head hanging down.

This was considered a sure sign of either death or wrath of the Akuas and it may be imagined what the effect of such a communication would be on the superstitious mind. The Kahunas were not "Doctors" in our sense of the word, as they used only a few native plants, not so much for the effect of the thing itself, but more as a medium favoring the action of the "familiar spirits." Among the substances used was the root of the "Awa", which when chewed and fermented made an intoxicating drink; oftener demanded for the Kahuna than for the patient, as the former claimed that under these circumstances he saw in a vision what was needful in the particular case.

Kahunism combined in itself all the features of "Voodooism", those of the Indian "Medicine Man" and the Roman "Augur" with many of its own.

Certain fowls and animals were highly esteemed as sacrifices and offerings to the Aumakua; whether the occasion was that of praying an enemy to death or restoring a friend to health. Among these may be mentioned spotted dogs and pigs, white and red roosters, some kinds of fish, as the "Squid"—the latter was also used as a medicine. The particular fowl, animal or fish used on the occasion depended upon the nature of the case and was left to the judgement of the Kahuna. After the offering was baked or roasted it was eaten by the assembled company. Among the special variety of Kahunas will be mentioned only the following:

First—KAHUNA LAPAAU or Medicine Men. In ordinary cases of illness believed to be caused by the displeasure of the

Aumakuas, offerings and prayers were made in the temple, but in severe cases the Kahuna lapaau was called in; who was believed to be able to propitiate the spirits causing the malady. Certain remedies were also used but as before said, more as mediums through which the spirit would act than as having any virtue in themselves. The result, favorable or otherwise, was judged by many omens too numerous to mention. The two Medicine Gods were MAIOLA and KOLEAMOKU. After these were duly prayed and sacrificed to, the Kahuna would go to sleep so as to receive from his akua in a vision all the necessary information as to the cause and progress of the disease, including the prognosis and treatment. If it did not rain during the night, a rooster—red or white according to the case—was baked for the Aumakuas, also two dogs, one for the men and one for the women, five cloths (kapa) being used to cover each oven. These were eaten by the relatives of the patient. Sometimes the sick man was given a steam bath by being seated on a pile of hot stones covered with wet leaves. If he grew worse some squid was spread out all night and cooked in the morning. Some of the squid (hee) was then fed to the patient in the midst of prayers. If no relief came it was believed that some malignant akua had been sent by a sorcerer to destroy him.

The only thing to do in this case was either to placate the demon or send him back to his master or to employ a more powerful one to expel him. Under such circumstances Sorcerers who had "familiar spirits" at their command were usually employed. These were of two kinds, Mediums and Sorcerers.

Second—There were several varieties of the former as KAHUNA HOONOHU and KAHUNA HOOUNAUNA. The methods of these were similar. Their chief God was called ULI, but there were many lesser demons, generally females, who were always ready to be sent on errands of mischief—as PUA, KAPO, KIHAWAHINE a reptile Goddess, etc. When a Medium or Necromancer employed for evil purposes the spirit of an ancestor the demon was called "UNIHIPILI." This service was obtained by preserving his bones and the constant use of incantations and offerings at every meal. If he or his heirs failed to observe these rites, even for one day, the evil power invoked would turn against him to his own downfall. The "KAHUNA HOONOHU" used means much resembling modern spiritualism. The medium himself was called

the "IPU" of the spirit, while the latter was called "MAKANI" or wind. The spirit sometimes descended upon the "IPU" and often spoke from the roof of the hut. These mediums always required "awa" before giving an opinion, as it was only after drinking it that the spirit came down upon the Kahuna. The KAHUNA HOOUNAUNA had the power of sending demons and familiar spirits on errands. His value depended upon whether his incantations or his demons were more powerful than those of the hostile sorcerer. A mighty sorcerer could force the demon to tell who sent him and even to return and put to death his own "IPU".

Third—There were other sorcerers, as Alexander says, "more like evil spirits than human beings." These were so much hated and feared as to be sometimes put to death by order of a chief. The principal of these were the ANAANA, the KUNI, the HOOPIOPIO and PAHIUHIU, and the APO LEO. ULI was their God. The ANAANA and KUNI rites were much alike. They performed their incantations at night, after having procured, as was said above, a lock of hair, cuttings of nails, saliva, etc., belonging to the victim. These articles were called *maunu* or bait. This was buried or burned. They were said also to use poison, but generally the fears of the intended victim were sufficient to cause loss of appetite and sleep and finally death. These Kahunas often used their talents for revenge, but were open to the highest bidder. The HOOPIOPIO and PAHIUHIU class of Kahunas made a magic mark or square in the road along which their intended victim would pass, placing a stone in the centre upon which if the person stepped he was sure to die in a few days.

The above was accompanied by prayers to ULI or to KANEPOHAKAA who was the Aumakua in the stone. APO LEO is the power of depriving one of articulate speech. To accomplish this, the Kahuna prayed to his usual Gods at night amid free libations of awa.

In the morning he conversed with his intended victim, during which he caught and took away his voice so that he could never speak again. Sometimes the Sorcerer willed his death, which was supposed to take place in a few days. There was also a poison God—KALAIPAOHA—who was much sought after. The poison tree growing on the great volcano of Mauna Loa was revealed to a certain person in a dream and by him cut down and

made into an idol. Whoever possessed this idol was believed to have the power of destroying his enemies at will. Kamehameha the Great was said to have kept this image always near him.

Fourth—KILOKILO or *Diviners*. Those who were called KILOKILO-UHANE, were acquainted with the condition of the soul—"uhane". They would inform a person that they had seen his double or wraith wandering naked with his eyes shut and tongue hanging out. This was a sure sign that his *akua*s were angry and the person was willing to do anything to avert their wrath and avoid the loss of his other soul. The Kahuna always required chickens, dogs, fish, pigs, etc. with plenty of cloth to cover the ovens; besides a generous fee. He then pardoned the offender and restored to him his lost soul. There were also a class of Diviners called PO'I-UHANE. These could not only see the soul but catch it in the hand. They then could either squeeze it to death or confine it in a calabash. The owner of this soul was then in the sorcerer's power, as he could blackmail him whenever he pleased. There were also *astrologers*, *soothsayers* and *prophets* who predicted fortunes and the weather, but were harmless. It is remarkable that out of this mass of ignorance and superstition—of which only a small part has been told—the Hawaiians have developed a Christian civilization of a high order.

The effort, however, has proved exhausting as this interesting race is fast dying out. From a population of over 200,000 when Captain Cook discovered the islands they have dwindled to about 40,000 in little over 100 years.

#### AUTHORITIES.

Alexander's "History of the Hawaiian People."

Some of Edmund P. Dole's (Attorney General of Hawaii) writings.

"Ancient Hawaiian Legends" by the late King Kalakaua.

Personal observations and inquiries during a stay of 27 months in Honolulu.

N. B. The Hawaiian language consists of twelve letters—the five vowels and seven consonants. The pronunciation is like the present continental style in Latin. The accent is always on the penult except a few proper names on the last syllable. The t and k are interchangeable as are the r and l and the b and p: as *kalo* for *taro*; *kapu* for *tabu*. Every syllable and every word end in a vowel.

## Reprints and Translations.

### MEDICO-MILITARY ORGANIZATION OF THE JAPANESE ARMY, 1894-1895.

THE British Army Medical Service was represented in the field during the Chino-Japanese War in 1894-1895 by Sir William Taylor, whose comprehensive report upon the medico-military arrangements of the Japanese army is of great importance today in view of the situation in the far east. The following features, referring particularly to organization are of special interest :

#### MEDICAL SERVICE OF REGIMENTS AND BATTALIONS.

##### *Infantry regiment:*

- 2 Surgeon-Captains (1 may be Surgeon-Lieutenant-Colonel).
- 4 Surgeon-Lieutenants.
- 3 Chief Attendants.
- 12 Ordinary Attendants.
- 48 Reserve (i. e. regimental) bearers.
- 6 Panniers (3 horses) and 12 stretchers (1 horse).

##### *Cavalry battalions:*

- 1 Surgeon-Major or Surgeon-Captain.
- 1 Surgeon-Lieutenant.
- 1 Chief Attendant.
- 1 Ordinary Attendant.

No panniers or stretchers, only the medical and surgical bag carried by each chief attendant.

##### *Battalion of Artillery:*

- 1 Surgeon-Major or Surgeon-Captain.
- 2 Surgeon-Lieutenants.
- 1 Chief Attendant.
- 6 Ordinary Attendants.

2 Panniers carried on a wagon in the field, and on a pack-horse in mountain artillery.

*Battalion of Engineers:*

- 1 Surgeon-Major or Surgeon-Captain.
- 1 Surgeon-Lieutenant.
- 1 Chief Attendant.
- 2 Ordinary Attendants.

No panniers or stretchers, only the medical and surgical bag carried by each chief attendant.

*Battalion of Transport:*

- 1 Surgeon-Major or Surgeon-Captain.
- 2 Surgeon-Lieutenants.
- 3 Chief Attendants.

The Japanese regiment of infantry consists of three battalions of four companies each, the companies numbering two hundred men; the regimental strength being therefore 2,400. The forty-eight reserve or regimental bearers, four to each company, are trained men belonging to the regiment, distinguished by a red band worn above the elbow of the left arm. They are not neutralized by the Geneva Convention.

The scope of the regimental medical service in action comprises: 1st, Medical aid in the fighting line, and 2nd, Service in the temporary dressing stations. One-half of the personnel remains upon the line engaged, following closely its movements, and the other assists at the temporary, regimental, dressing stations, to which it has proceeded with the pack animals carrying the medical and surgical equipment. These stations are closed or advanced when the bearer companies begin their organized work: the regimental bearers, who have deposited their arms and knapsacks either at the dressing stations or with the regimental reserve, returning to their companies unless otherwise directed. The chief and subordinate attendants are employed with the front under fire, and primarily at the dressing stations, but the Japanese regulations seem to insist upon the regimental medical service keeping well closed up in touch with the battle front, relying upon the advance, or corresponding movement, of the bearer columns and field hospitals in their turn.

**BEARER COMPANIES.**

The bearer companies, of which there are two to each division, together with a central administration, or center, form a divisional organization.

PERSONNEL OF CENTER.

- 1 Captain, called captain of the medical staff corps (mounted).
- 2 1st or 2nd class under officers (1 clerk, 1 superintendent cook).
- 1 Surgeon-Major as chief medical officer (mounted).
- 1 Surgeon-Captain (mounted).
- 6 Surgeon-Lieutenants (mounted); in guards 4.
- 1 2nd or 3rd class pharmacist officer.
- 3 Pharmacists; in guards 2.
- 10 Chief attendants; in guards 8.
- 26 Attendants, under officers; in guards 20.
- 1 Commissariat officer, 2nd or 3rd class.
- 1 Clerk, 1st class, under officer.
- 1 Transport under officer (mounted).
- 3 Transport soldiers (1 at least a shoeing smith, mounted).
- 36 Transport carriers with 36 pack horses; in guards 33.
- 2 Servants.
- 9 Grooms; in guards 7.

Total 104—viz., 11 officers, 43 under officers, 50 men, 49 horses.

PERSONNEL OF BEARER COMPANY.

- 1 Captain of company (may be a lieutenant) (mounted).
- 1 Under officer.
- 2 Sub-division commanders, 1st class under officers.
- 6 Section commanders, 2nd class under officers.
- 145 Bearers (1 trumpeter, 1 tailor, 1 shoemaker); in guards 109.
- 1 Horse boy—soldier.

Total—156—viz., 1 officer, 9 under officers, 146 men, 1 horse; in guards 120.

Each company forms two subdivisions of three sections each.

Total for center and bearer companies, 416 officers and men, and 51 horses.

This column is under the control of the division commander, who is advised by the chief of the division medical staff, this latter assuming control when delay will ensue in communicating with the division commander.

Each bearer column bears the name of the division to which it belongs, and as to personnel and material is so organized that it can at any time be divided into two equal parts. In organizing, matters relating to medical personnel and medical and surgical equipment are dealt with by the chief of the medical staff of the division, but the rest is in charge of the transport battalion commander.

The order of march of the column is fixed by the division

commander, but ordinarily one-half marches with the advance guard, in front of the second line of the first artillery company, and the other half in the main body, in front of the second line of the artillery regiment.

The function of the bearer column is to act between the fighting line and the field hospitals, serving the intermediate dressing stations primarily established by the regimental medical personnel; which thus relieved returns to the fighting front.

The dressing stations, of which the number is not indicated in the report, are established under the usual conditions as to protection from fire, accessibility by road, vicinity to water and are distinguished during the day by a white flag with a red cross, and by the national flag; while at night they are marked by red lanterns. The usual guidons are also placed.

The work of the dressing station is divided into three parts or sections, indicated by flags or banners of different colors.

(a) Receiving and forwarding section, blue. Personnel: one medical officer, one chief attendant, one or two attendants.

(b) Operating section, white. Personnel: one surgeon-major, chief of the center usually; two or three medical officers as assistants, and some chief attendant or attendants.

(c) Dressing section, red. Personnel: one medical officer, and some chief attendants or attendants, as assistants.

The functions of these sections are sufficiently indicated by their names. In each the most minute care is given to the records. The identification of patients is secured, if they are not able to give the information, by examination of the identity tag or metal label worn by all, the officer's name being engraved, the soldier's regiment and number given; from the pocket-book, cap, or clothing. The registry of all property is also provided for.

#### FIELD HOSPITALS.

There are six field hospitals to each division, bearing the division name, and numbered from one to six. Three are with the first line of transport and three with the second. Their function is to receive wounded from the dressing stations; or directly from the fighting line, to continue or complete the treatment previously received, and to be prepared for rapid evacuation should the relief of the bearer column be necessary.



The medical personnel and material, the clothing of the patients and the utensils, are selected by the chief of the medical staff, all other material and equipment, including animals, is provided by the commanding officer of the transport battalion. The latter also regulates the march and encampment of the field hospitals.

FIELD HOSPITAL PERSONNEL.

NOS.	DESIGNATION.	OFFICERS.	UNDER OFFICERS.	MEN	HORSES
1	Chief, Surgeon-Major.....	1	.....	.....	1
1	Surgeon-Captain.....	1	.....	.....	1
4	Surgeon-Lieutenants, 1st or 2nd... ..	4	.....	.....	.....
1	Pharmaceutist, 2nd or 3rd class. . .	1	.....	.....	.....
1	Commissariat officer of the intend- ance, 1st or 2nd class.....	1	.....	.....	.....
6	Chief Attendants.....	.....	6	.....	.....
3	Pharmaceutists.. ..	.....	3	.....	.....
6	Attendants .....	.....	6	.....	.....
34	Orderlies .....	.....	.....	34	.....
1	Mechanic.....	.....	.....	1	.....
2	Clerks, 1st, 2nd or 3rd class.....	.....	2	.....	.....
6	Soldiers, as clerks and cooks.....	.....	.....	6	.....
1	Transport under officer.....	.....	1	.....	1
3	Transport soldiers (one at least a shoeing-smith.....	.....	.....	3	3
38	Carriers.....	.....	.....	38	38
6	Servants.....	.....	.....	6	.....
2	Horse boys.....	.....	.....	2	.....
116	Total.....	8	18	90	44

This would furnish to each division, 48 officers, 108 under officers, 510 men and 264 horses.

FIELD HOSPITAL EQUIPMENT.

Field panniers, 4.....	2 horses.
Reserve " 8.....	4 "
Tents, 4.....	4 "
Clothing.....	13 "
Diet materials.....	5 "
Cooking utensils.....	4 "
Camp utensils, treasure chest, officers' baggage, re- serve clothing.....	3 "
Spare.....	3 "
<hr/>	
Total horses.....	38

The quota of patients for each of the hospitals appear to be

200. Specific directions are given as to the choice of situations for these hospitals, shelter from fire, readiness of access, cleanliness of ground, avoidance of unsanitary villages. If, however, suitable houses or villages are available, they will be occupied, and a certain division of accommodation made.

- (1.) Administrative offices, (including financial), in the centre.
- (2.) Receiving and dispatching office.
- (3.) Wards for patients.
- (4.) Operating theatre.
- (5.) Dispensary, including store for medical and surgical equipment, and for the mechanic.
- (6.) Kitchens.
- (7.) Bathrooms (sometimes dispensed with).
- (8.) Mortuary, in detached and separate buildings.
- (9.) Latrines, in detached and separate buildings.
- (10.) Recreation room.

The directions as to the routine administration, operations and records are carefully drawn. The position of the field hospital is indicated by the same means as previously described for the dressing stations.

#### TRANSPORT.

Passing from the field hospitals to the rear, along the lines of communication to the base, patients are in the hands of the hospital transport staff. There is an organization of this kind for each division, as to which the chiefs of the division medical and intendance staff, and the battalion transport commanders, are charged with certain duties. This divisional unit is controlled by the division commander; and operates only so far as the etape jurisdiction on the line of communication. It consists of:

- |   |                        |
|---|------------------------|
| 1 Chief, Major or Captain,                | 2 Medical officers,    |
| 1 Chief attendant,                        | 2 Ordinary attendants, |
| 1 Clerk,                                  | 3 Orderlies,           |
| 3 Servants,                               |                        |
| Total—3 Officers, 4 under officers, 6 men |                        |

The etape medical staff governs the medical service on the line of communication and consists of:

- 1 Surgeon Lieutenant Colonel or Surgeon Major as Chief of Etape Medical Staff.
- 1 Surgeon Captain or Surgeon Lieutenant.
- 1 Pharmaceutist (when there is no reserve medical store.)
- 1 Under officer.

There is also to each division a reserve medical staff, and a reserve medical store, the personnel of each being specifically designated, the number of animals allotted, its jurisdiction and mixed responsibility defined.

To return for a moment to the sequence of medical control. The medical staff consists of:

For a division:

- 1 Surgeon Colonel, or Lieutenant Colonel, as Chief.
- 1 Medical Officer.
- 1 Pharmaceutist officer.
- 2 Chief attendants (under officers.)

For an army:

- 1 Surgeon General or Surgeon Colonel as Chief.
- 1 Medical officer.
- 2 Chief attendants (under officers.)

Finally the supreme medical control is vested in a Field Medical Commander, who is the chief of the Medical Department of the War Office, and during war serves with the Grand Headquarters of the army. He has for his personal staff:

- 1 Surgeon Lieutenant Colonel or Surgeon Major.
- 1 Pharmaceutist officer.
- 2 Clerks.

#### GENERAL HOSPITALS AT THE BASE.

The reserve hospitals are established either within military garrisons or outside, and civil hospitals or other suitable buildings are utilized. They bear the name of the locality where they are situated, as: "Shimoniseki Military Reserve Hospital," or "Hiroshima Military Reserve Hospital." They have the following personnel:

- 1 Chief; Surgeon-Colonel, Surgeon-Lieutenant-Colonel, or Surgeon-Major
- 2 to 3 Medical officers.
- 1 " 4 Pharmaceutists, officers.
- 1 Commissariat officer.
- 3 to 5 Chief attendants.
- 1 " 6 Pharmaceutists, under officers.
- 2 " 8 Commissariat, under officers or men.
- 30 " 40 Attendants.
- 1 or 2 Mechanics.

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42 to 70 officers and men (5 to 9 officers, 37 to 61 under officers and men.)

For every increase of 40 patients over 120, 1 medical officer, 1 chief attendant and 10 to 13 attendants may be added.

Deficiencies among the medical and pharmaceutical officers may be supplied by temporary civil practitioners and pharmaceutical officers; among the attendants and pharmacists, by first or second class attendants, or by hired employees. The duties of all, except of the hospital chief, commissariat and under officers, may be taken by members of benevolent societies.

The responsibility is to the commander of the territorial division.

#### THE ROYAL ARMY MEDICAL COLLEGE, LONDON, ENGLAND.

THE British Army Medical School at Netley has had a long and distinguished career from the time of the Crimean War to the present date. The progress of military medicine in the Twentieth Century, however, has rendered the facilities afforded by it insufficient and for some time past a new institution for the instruction of the Medical Staff has been in course of preparation on the Thames embankment in London, where in addition to the opportunities afforded by the college itself, all the clinical and other educational facilities of the greatest city in the world will be at the disposal of the medical officers attached to the institution.

The new Royal Army Medical College will consist of a Laboratory block, a Mess and Officers' Quarters and the Commandant's house. The buildings are to be erected on the left bank of the Thames on a site formerly comprised in the Millbank Prison, to the south of the Tate Gallery. They will be constructed of red brick and stone. Adjoining them will be the Army Service Corps Barracks and the new Station Hospital for London, from which material for clinical study will be drawn.

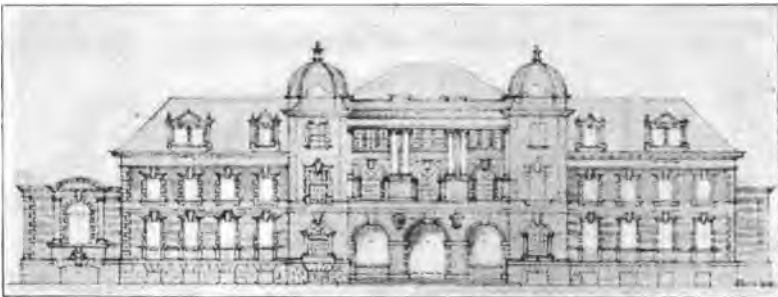
The facade of the Laboratory Building,—the college building in fact,—is shown in the illustration. It will contain on the first floor a covered yard for experiments in small projectiles; a room

for hygienic experimental apparatus; work shops; a microphotographic room; rooms for distillation, disinfection and sterilization; store rooms; cloak room lockers and cycle stable for the officers.

On the ground floor will be located an amphitheatre with accommodations for 200; hygiene and pathology class rooms 80 by 50 feet each, with annexes and laboratory connected with each department.

On the first floor, through whose height the theatre and class rooms rise, will be found also library and reading rooms each 30 by 60 feet, pathological research rooms and lavatories.

On the second floor there will be a museum and model room each 40 by 25 feet with overhead lighting, together with accommodations for teaching operative surgery.



**The Royal Army Medical College, London, England,—the Laboratory Building.**

The laboratory facilities offered by the College and the clinical opportunities offered in the Hospital will be a powerful factor in promoting the efficiency of the Royal Army Medical Corps, particularly if the plan to station there every medical officer returning from foreign service is carried out.

The construction of this splendid institution marks an era in military medicine, not only in Great Britain but in the world and it is trusted that the erection of the United States Army General Hospital and Medical School, a bill for which is now in the hands of Congress, may enable the United States of America to afford similar facilities to its own army medical department.

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**JOSEPH LOVELL,  
SURGEON GENERAL OF THE UNITED STATES ARMY,  
1818-1836.**



## Editorial Department.

### The Surgeon Generals of the United States Army

VIII. JOSEPH LOVELL, SURGEON GENERAL OF THE UNITED STATES ARMY, 1818-1836.

**H**ITHERTO there had been no systematic and responsible medical organization in the army. Regimental and hospital medical service had been disconnected and inharmonious during the entire War for Independence. After the close of the Revolution there survived only the regimental Surgeons and Surgeon's Mates, attached to the regiments then formed; medical officers sometimes called Garrison Surgeons and Surgeon's Mates, but more frequently styled Post Surgeons and Surgeon's Mates, were provided for permanent garrisons in 1802; and from time to time, as necessity demanded, Hospital Surgeons and Surgeon's Mates were also provided, the several classes ranking relatively in the following order: (1) Hospital Surgeons, (2) Regimental Surgeons and (3) Post Surgeons.

In 1818 Congress again reorganized the medical service, this time taking a genuine step toward system and providing for a surgeon general, assistant surgeon generals, regimental surgeons and surgeon's mates, and post surgeons, with the latter of which the preexisting hospital surgeons were consolidated—a provision which gave those officers much justifiable dissatisfaction, as rendering them junior in rank to regimental surgeons to whom they had previously been senior.

Here for the first time appears the office of Surgeon General by the name which has clung to it to the present time. The first incumbent of the new office was Dr. Joseph Lovell, who was born in Boston, Mass., December 22, 1788, of a family famous for its patriotic character. His grandfather had been a member of the Continental Congress and actively connected with the Sons of

Liberty, while his father was conspicuous in public affairs. The future Surgeon General was graduated from Harvard in 1807, and at once entered upon the study of medicine in Boston under the preceptorship of Dr. Ingalls, a well-known practitioner of that city. His work was painstaking, practical and thorough, so that, when in May 1812, he entered the military service as Surgeon of the 9th Infantry, he was recognized as exceptionally well equipped for duty. It was this fact which led to his early detachment from his regiment and assignment to the charge of the general Hospital at Burlington, Vermont. Here he displayed not only great skill as a practitioner but administrative qualities of a character so unusual as to elicit the highest commendation of his superiors. In August, 1814, he received the well-merited recognition of selection for appointment to the grade of Hospital Surgeon, which he continued to hold until his appointment as Surgeon General four years later.

Immediately on his entrance upon the office, the surgeon-generalcy began to make itself felt. Orders were issued requiring all medical reports to be made to the Surgeon General and specifying that all orders referring to medical officers should be issued through him. He at once revised and reissued the Regulations of the Medical Department, more clearly defining the functions and conduct of its various components. Thenceforward, the medical officer had a friend at court. Quick to resent any imputation or imposition upon his department or any of its members, the medical service had in him a fearless, loyal and staunch support, whose kindness to his friends and comrades was as unflinching, as his antagonism toward efforts against them was sure.

In the army act of 1821, the experience of the preceding quarter of a century was more definitely materialized in the formation of a medical department, practically on the lines of the present organization, the titles of regimental surgeon, post surgeon, surgeon's mate and the like being finally and definitely superseded by those of surgeon and assistant surgeon. In 1834 the medical service was still further developed by an act providing for the system of admission upon examination, perhaps the most important of all the elements which have contributed to the

high professional standing of the army medical corps down to the present day. The same act also fixed the pay and emoluments at practically the same relative figures as now prevail.

Among the questions with which Dr. Lovell had to deal was that of private practice upon the part of military surgeons, and it was remarked with surprise that in his revision of the Regulations in 1818, he retained the provision introduced in 1814 prohibiting the engagement of army medical officers in civilian professional work. He explained however, that the clause in question was designed simply to prevent devotion to outside work to the prejudice of a surgeon's official duties. The regulation had hitherto been unobserved and now continued to be practically inoperative until rescinded years afterward.

His hearty disposition to please the officers of his corps led him to engage in an effort to obtain for them satisfactory precedence in the questions of choice of quarters and of stations. The former was settled by the promulgation of an order providing that Surgeons should have choice of quarters next after Majors; Assistant Surgeons of over ten years' service with Captains; Assistant Surgeons of over five years' service with 1st Lieutenants; and Assistant Surgeons of less than five years' service with 2d Lieutenants.

The problem of choice of stations was more difficult of solution, and orders issued providing for selection according to rank had to be rescinded. While thereafter not absolutely authorized by orders, however, the principle continued to be practically in force for the next half century and upwards.

Possibly the most dangerous crisis of his administration occurred in 1830 when one of the periodical waves of virtuous retrenchment swept over the government and the Secretary of War, being called upon for items of expense in his department, which could be reduced, expressed the opinion that the Surgeon General was a superfluous officer and recommended the abolition of the position. This statement Dr. Lovell strenuously combatted, supporting his contention by arguments so effective that after long consideration Congress determined not only to retain the existing organization but to materially increase the personnel.

In December, 1835, the Seminole War broke out and Dr. Lovell promptly met the various emergencies connected with the

Florida campaign as they arose. A supply depot was established at Tampa and a general hospital at St. Augustine. The deficiency in medical officers was provided for by a recommendation to Congress for a numerical increase of the medical corps, in response to which a small addition was authorized.

This recommendation was practically the last official act of its distinguished author. About this time his wife, between whom and himself there was a profound attachment, died and he never recovered from the blow. A constitution never very strong, worn out by grief and the prolonged anxiety occasioned by her illness, was unable to sustain the shock of his loss, and he also passed away on October 17, 1836.

Dr. Lovell, while jealous of the honor and reputation of his corps, and zealous in every movement toward its advancement, was also actively interested in everything which might add to the efficiency of the service at large. He vigorously fought the whiskey ration and to his earnest opposition was due its final abolition. He studied deeply the questions of the soldiers' rations and clothing with the result of great improvements in both as the outcome of his representations. And in numerous other ways he made his impress upon the service as a fearless and diligent officer, an honest and high-minded gentleman, and an unselfish and disinterested philanthropist.

His principal work was however as a medical officer, in which capacity he showed himself a skillful physician and a dexterous surgeon, a capable organizer and a judicious administrator, ever loyal to his corps and faithful to his office as its head. Quick to resist any intrusion upon the rights of his department or any of its members, he was equally prompt in opposing presumption or disloyalty upon the part of his subordinates or superiors. Personally genial and gentle in manner, kindly and considerate in character, he greatly endeared himself to his corps, the members of which became imbued with the deepest respect and veneration for his tact, wisdom and executive ability, and most heartily, as an expression of the affectionate respect with which they regarded him, joined after his death in the erection of an imposing monument to his memory in the Congressional Cemetery at Washington.

WASHINGTON'S BEQUEST TO PHYSICIAN GENERAL  
JAMES CRAIK, U. S. ARMY.

**I**N the biography of Physician General James Craik, published in a recent number of the JOURNAL OF THE MILITARY SURGEONS, reference was made to the bequest of President George Washington to Physician General Craik, the will specifying that, "to my compatriot in arms and old and intimate friend, Dr. Craik, I give my bureau (or as the cabinet makers call it tambour secretary) and the circular chair, an appendage of my study." Through the courtesy of the Very Reverend Charles Ewell Craik of Louisville, Ky., we have the pleasure of presenting herewith an engraving made from a photograph of this valuable old secretary as it exists today at "Kanawha," the country place of the Craik family near Louisville, Ky., where it holds a place of the highest honor as at once a venerated relic of an illustrious ancestor and a memorial of the first American. The article is in a fine state of preservation.



The Tambour Secretary Bequeathed to Physician General James Craik by George Washington.

## THE SENN FIRST AID PACKET IN JAPAN.

**I**T is interesting to note the receipt of a letter from Dr. Suzretti, Chief Medical Officer of the Japanese squadron before Port Arthur, stating that he is about to substitute the Senn First Aid Packet, described in the JOURNAL OF THE MILITARY SURGEONS for December, 1903, for the one formerly employed in his command.

## Reviews of Books.

### GUNSHOT WOUNDS OF THE CRANIUM AND ITS CONTENTS.\*

**F**OR many years Professor Nimier, medical officer ranking as Colonel in the French Army and Professor at the Military Medical School of Val-de-Grace, has paid especial attention to gunshot wounds of the cranium and its contents. Our readers will remember an interesting case reported by him in the JOURNAL some time since. In this handsome work of 624 pages he crystallizes his experiences and opinions, dividing the subject into twenty-three sections, among which may be mentioned gunshot wounds of the cranium in general, lesions of the encephalon and infected wounds of the parts under discussion. He then takes up the subject by regions, devoting five sections to the Rolandic region, and single sections to the consideration of wounds of the language, visual, auditory, olfactory and gustatory centers, etc., closing with a detailed and interesting discussion of the treatment. The book is a compilation of the teachings of Professor Nimier in his lecture room at Val-de-Grace and is up to date both from the surgical and neurological standpoint.

### THE STORY OF NEW ZEALAND.\*

**I**T is unusual to take up a work so distinctly sociological as The Story of New Zealand in a military or medical journal, but this particular book contains so much of value to the military and medical public that we take particular pleasure in inviting the attention of our readers to it. The unique situation of

\**Blessures du crâne et de l'encéphale par coup de feu*, par H. NIMIER, médecin principal de 1<sup>re</sup> classe, professeur au Val-de-Grâce. 1 fort vol. gr<sup>d</sup> in-8° avec 158 gravures dans le texte. 15 fr. Paris, F. Alcan, éditeur, 1904.

\**The Story of New Zealand* by Prof. FRANK PARSONS. Edited by C. F. Taylor, M.D.; 8vo; pp. xxiv, 836, with 170 illustrations; Philadelphia; Charles F. Taylor, M. D., 1903.

New Zealand, the original way in which it has solved many social problems and its remarkable political composition are all picturesquely, effectively and accurately brought out. "From savage cannibalism to the highest civilization in a lifetime; from one of the poorest countries in the world to the richest (per capita) in half a century; from racial war to racial harmony in a generation; from industrial war to industrial peace in a decade; from charity to justice, competition to cooperation, monopoly to diffusion, despotism to democracy; government by landlords and the money power in their own interest to government by farmers and workingmen in the interest of all as the outcome of a great election,—is certainly a record of change in condition and policy, which for quantity, quality and speed of progress is without a parallel" and which embodies a lesson well worth the consideration of every active citizen of modern times.

#### SAUNDERS' MEDICAL HAND ATLAS OF OPERATIVE GYNECOLOGY.

**T**HIS volume well sustains the excellent reputation of this admirable series. It appeals especially to the general practitioner remote from access to the facilities of the medical schools and clinics. The numerous plates are distinct and illustrative and bring out with exceptional clearness the points elaborated upon in the text which in itself is well up to date and carefully and judiciously selected.

#### FOX'S DISEASES OF THE EYE.\*

**T**HIS book is a particularly handsome and well digested discussion of ophthalmic practice systematic in its arrangement, clear in its expression and practical in its applications. Among the points to which particular attention is

\**Atlas and Epitome of Operative Gynecology.* By Dr. O. SHÄFFER, of Heidelberg. Edited with additions by J. CLARENCE WEBSTER, M. D. (Edin.), F.R.C.P.E., of Chicago. 12mo.; pp. 138; 42 lithographic colored plates and numerous cuts. Philadelphia, New York and London, W. B. Saunders & Co., 1904.

*Diseases of the Eye.* By L. WEBSTER FOX, M. D.; 8vo; pp. 584, with 301 illustrations. New York and London; D. Appleton & Co., 1904.

given are retinitis,—albuminuric and hemorrhagic,—lid operations, declinations of the retinal meridians, cataract, glaucoma and diseases of the orbit. The illustrations are particularly good and tend to give especial effect to the clearness of the subjects discussed. The book is especially applicable to the use of the general practitioner.

#### THE STANDARD MEDICAL DIRECTORY.\*

**T**HIS work has very greatly improved since the appearance of the first volume about two years ago. Its character and appearance received very favorable comment in the *JOURNAL* at that time. Since then it has been very largely developed, principally by the addition of a remarkably complete and accurate alphabetical index, so complete indeed that in looking for the address of any particular physician it is not usually necessary to go beyond the index itself. The profession is to be congratulated upon the possession of so fine a work of reference.

#### THE AMERICAN YEAR BOOK OF SURGERY.\*

**T**HE Surgical volume of the American Year Book for 1904 presents a well condensed view of surgical science under the several heads of General Surgery, Obstetrics, Gynecology, Orthopedic Surgery, Ophthalmology, Diseases of the Nose, Throat and Ear, and Anatomy. The work is well done and the present volume quite surpasses in value the previous annual issues. A noteworthy improvement is the introduction, at the head of each chapter of a summary of the more conspicuous advances and discoveries of the year.

\**The Standard Medical Directory of North America, 1903-4.* Including a directory of practicing physicians in the United States of America, Canada, Cuba, Mexico and Central America. List of practitioners of the specialties and alphabetical index of all physicians in North America. 4to.: pp. 1226: Chicago, C. P. Engelhard & Co., 1904.

\**The American Year Book of Surgery.* Edited by GEORGE M. GOULD, M. D. 8vo: pp. 681. Philadelphia, New York and London, W. B. Saunders & Co., 1904.



## THE ARMY AND NAVY GENERAL HOSPITAL AT HOT SPRINGS, ARKANSAS.

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THE Army and Navy General Hospital at Hot Springs, Arkansas, consists of a small colony of isolated buildings, situated in a beautiful park, on high ground overlooking a diversified country, and above the town which is spread out in the valley below. In the distance are hills and mountains, while adjacent is the Interior Department Reservation of Hot Springs, Ark., with its famous springs of hot water issuing from the beautifully parked mountain-side.

The construction of this Hospital was commenced in 1883, and completed in 1885. It remained as originally designed up to November 1899, when an elaborate scheme for its reconstruction was fully matured and carried out by myself acting in the capacity of Quartermaster. The Hospital has been practically rebuilt in almost every particular, except the removal of the walls.

### THE ADMINISTRATION BUILDING.

The Administration Building is a large, square, three story structure, situated at the apex of the triangle formed by the buildings on the brow of the hill facing the city. It contains the administrative offices, and the private rooms for officers and special patients. Each floor is surrounded by wide verandas, and the whole building is adapted to the purposes for which it was designed.

In this structure new floors have been laid; all the rooms have been renovated; and the walls and ceilings have been painted. The old plumbing was removed and a modern system installed.

### THE ANNEX.

In the rear of the Administration Building, and connected therewith, is the structure known as the Annex. On the first

floor of this building are the dispensary, and a spacious examining room, fitted with every appliance for examining patients entering the hospital.

The interior of this building was torn out and the whole structure practically rebuilt. New floors have been laid, new ceilings have been put in place, and the walls replastered and painted.

On the second floor is a modern laboratory, especially designed for clinical investigation, and fully equipped in every particular.

On this floor, also, a small, modern operating room, was constructed in accordance with the requirements of modern operative procedures. The walls and ceilings are finished in hard cement and enamelled. All corners have been rounded. The floor is of cement with a hard surface, allowing thorough cleansing and disinfection of the room, if such procedure should ever be necessary.

#### SOUTH WARD.

East of the Administration building, and connected with it by a spacious veranda, is situated the south ward of the hospital, a building 130 feet long and 30 feet wide, with an average height of 24 feet.

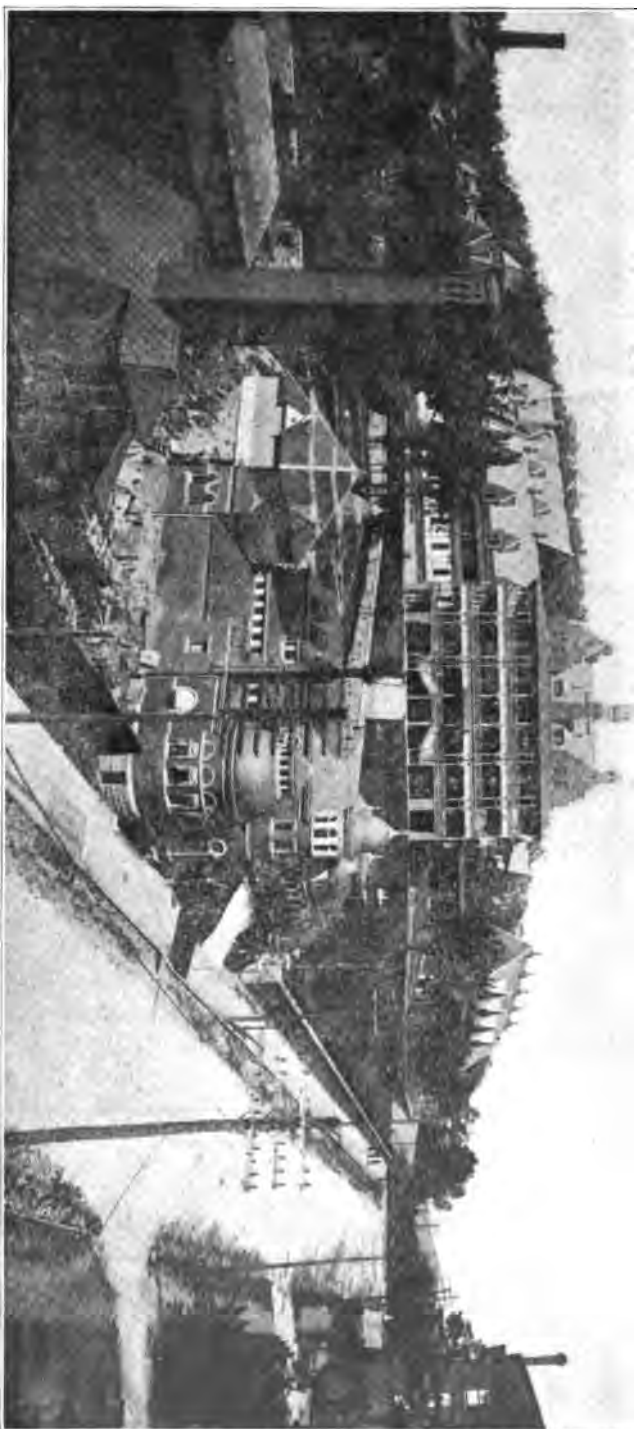
This ward contains 30 beds, is lined with a metal ceiling, has hard finished and painted side walls, and a quarter sawed hardwood floor. It is spacious, well lighted, well heated, and well ventilated, and is an ideal ward in every respect.

At the east end of the ward is a small room with lockers for patient's clothing. Next to this room is the linen room.

There is also a small reading and writing room, separated from the clothing room by a four foot passage way.

#### SERVICE BUILDING.

At the east end of this ward, and separated from it by an open passage way 12 feet wide, is the new service building 30 feet wide and 28 feet long. It is divided into three rooms: a lavatory; a service room for urinals, water closets, and slop sinks;



The Army and Navy General Hospital at Hot Springs, Arkansas.

and a smoking and card room for the patients. The ceilings are of metal, the walls are hard finished and painted. The floor of the smoking room is of hard wood. The lavatory and service rooms are finished with concrete floors.

The plumbing of this building is modern in every particular.

#### NORTH WARD.

North of the Administration building, and also connected with it by open verandas, is a duplicate of the South Ward, which is known as the North Ward.

The interior of this building has been reconstructed and is finished in the same manner as the South Ward. The service building is a duplicate of that of the South Ward.

#### VETERAN WARD.

East of the North Ward and North of the Mess Room, is situated the building containing the two veteran wards. It is separated from the North Ward by an open space, 50 feet wide, and is connected with the Mess Hall by a covered veranda. It is a two-story building 130 feet long and 30 feet wide. The first floor contains a ward with 24 beds; a lavatory; a service room with urinals, water closets, and slop sink; a linen room; and a clothing room, with lockers for patients' clothing.

The second story of this building is also a hospital ward, with a high arched ceiling, and with a lavatory, service room, linen room and clothing room.

Over the linen room and the service room is a small mezzanine ward, with a capacity of 8 beds, for special patients.

This building has recently been fitted with an elevator, for patients going to or coming from the bath house.

#### BATH HOUSE.

In close proximity to the North end of the North Ward is the bath house of the hospital. It is a large, capacious one-story structure of the same general design as the other buildings of the institution.

It is divided into two separate bathing establishments; one for officers, and the other for enlisted men under treatment in the hospital as patients.

The officers' bath house is divided into three rooms: first, the

dressings room, which is arranged with five small compartments for individual bathers, and as a lounging room for patients returning from the bath; second the bathing department proper, which is located in a large room containing four individual bath rooms, the two vapor chambers and the hot room.

This room is tiled with marble, which material also forms the partitions, wainscotings and fronts of the individual bath rooms, and the two vapor chambers.

The individual bath rooms are fitted with royal porcelain bath tubs, and all the conveniences necessary for such an establishment.

Third. The douche room, in which all the conveniences and appliances of a modern hydropathic establishment have been installed. There is a chair bath, a circular and a rain douche and a Barouch operating table.

The enlisted men's bath house occupies about two-thirds of the building, and is practically a duplicate of the officers' bath house, in enlarged proportions. The cooling room contains eleven small dressing rooms, for the convenience of the men. In the bathing room there are eleven bath rooms, with royal porcelain bath tubs, and with five vapor chambers. It, also, has a douche room, similar to that described for the officers' bath room. It is finished with marble floors, partitions and wainscoting and is complete in every respect.

#### ICE FACTORY.

North of the bath house, and separated from it by a space of 50 feet is the building in which is located the freezing tank, which forms a part of the ice-making and refrigerating plant of the hospital.

The ice machine is of the ammonia compressor type, with a capacity of 2 tons per day. In connection with this plant, the pipes have been run under ground to the refrigerating room under the kitchen where the perishable food for the hospital is kept in cold storage. This plant has been recently completed, and is giving entire satisfaction.

#### MESS HALL.

Occupying what is practically the center of the group of build-

ings is a structure in which is located the Mess Hall, and the dormitory of the hospital attendants. This building has been practically reconstructed. Only the walls, and the roof of the old structure remain; all other material being new.

The Mess Hall, now occupies the space on the first floor of this building, which was formerly reserved for the mess hall, kitchen, pantry passage ways, and store rooms. It is well arranged in every detail, and is a bright well lighted hall particularly adapted for the purpose for which it was designed. It has a metal ceiling, hard finished painted walls, and a hard wood polished floor. The second story of this building is used as a dormitory for the hospital corps detachment on duty at this hospital.

#### KITCHEN.

East of the Mess Hall and connected with it by a covered passageway is a new building in which are located the kitchen, scullery and bakery on the first floor. On the second floor are the living rooms for the cooks and the mess attendants. In the basement are the general store rooms, the fuel room, and the refrigerating room.

The kitchen is fitted with all modern appliances for cooking, and is well equipped in every respect.

The scullery contains a dish washing machine, and is arranged for the rapid disposition of the soiled crockery.

The bakery is fitted with a portable oven, with a capacity of 200 loaves.

The boiler which furnishes steam for the cooking appliances is located in the basement.

The motive power for running the machinery is a kerosene engine of two and a half horse power.

The ceiling of the kitchen is finished in metal, the walls are hard finished and painted, and the floor is of concrete.

#### POWER HOUSE.

On the west side of the hospital reservation, near the north end, is located the Power House, a brick structure, 85 feet long and 25 feet wide, of recent construction.

This building was designed, for the installation of two Bab-

cock & Wilcox boilers each of 134 horse power to take the place of the boilers of the three separate heating plants, which formerly existed at this hospital, and to furnish power for the lighting plant, the laundry, the ice-machine, and the power pump. It has been so arranged that the fuel room, is located under the main road, in order that the coal may be unloaded directly into the bunker, convenient to the front of the boilers.

At the south end of the building is the boiler room, the floor of which is 16 feet below the road level. In this room are located two Babcock & Wilcox boilers, and the various pumps and machinery necessary in producing the power.

#### ENGINE ROOM.

North of this room, and 4 feet higher in floor level, is the engine room, within which are located a 75 horse power steam engine, with a direct connected generator of 25 K. W.; a 20 horse power kerosene engine, with a generator of 12½ K. W. capacity, the ammonia compressor for the ice machine plant, and the steam pump for pumping hot water from the well to the reservoir at the highest elevation of the War Department reservation.

#### LAUNDRY.

Above the engine room, and occupying the north end of the second story of the power house, is located the hospital laundry, which has been fully equipped for the washing of the linen of the hospital.

#### THE RESERVOIR.

This reservoir is of recent construction and has a capacity of 150,000 gallons. Its walls are of concrete, supported by a retaining embankment and covered with a wooden roof, having open wire net work on the sides. It is located at the highest point on the hospital reservation. It is used as a cooling tank for the hot water from the well.

#### WELL.

In 1900 a 6 inch tube was bored in the rock, within the interior lines of the power house location, to the depth of 23 feet which resulted in finding an abundant supply of hot water, at a temperature of 140 degrees F. On a test run of the power pump

this well was proven to have a capacity of 240,000 gallons per day. It is immeasurably valuable in the economy of the hospital.

The hot water is pumped directly to the bath house, during bathing hours; and, also, into the storage reservoir, at the top of the hill, from whence it is conducted by a recently constructed Water System to the fire plugs, and to all the buildings of the hospital for general use.

#### CREMATORY.

In 1902 a crematory for the destruction of all the refuse of the hospital was constructed near the stable. This appliance has proven satisfactory in every respect, and disposes of all the refuse of the establishment without annoyance, even in calm weather.

#### VERANDAS.

All the buildings are connected by wide galleries and surrounded by verandas, which are enclosed by means of glazed sash and doors during the cool months of the year.

#### LIGHTING.

The hospital, is lighted by electricity, generated in the power house.

#### HEATING.

The hospital is heated by steam, in accordance with the patents of the Webster System of steam heating, which uses the exhaust steam from the several engines, as far as possible. The plant was installed in 1901, and has given satisfaction.

#### PLUMBING.

The antiquated system of plumbing, which existed up to the year 1900, was torn out and replaced by a complete modern equipment. The drainage of the hospital was also changed and a new sewer system constructed.

#### ROADS.

The roads within the hospital grounds, have been re-graded and rebuilt at large cost, and are now smooth, even and well drained.

The total expenditure of money for repairs, improvements, and additions during the years 1900-1902 was over \$165,000, and the result is a modern hospital with a capacity of 130 beds, self contained and complete in every respect, which will compare favorably with the elaborate structures of the large cities.



## THE PATHOLOGY OF CHRONIC SPECIFIC DYSENTERY OF TROPICAL ORIGIN.\*

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FROM the observations of Flexner, Curry and Strong, it has been definitely settled that a considerable portion of the dysenteric cases occurring in the Philippine Islands is due to a specific bacillus, which was first discovered and described by Shiga. This form of dysentery is known as acute specific dysentery, in contradistinction to the more common form occurring in these islands, due to the ameba and known as amebic dysentery. In the following report I shall consider the pathology of what I believe to be the *chronic* form of acute specific dysentery. In the service at the U.S.A. General Hospital, Presidio of San Francisco, Cal., we seldom see the acute forms of dysentery, almost all the cases coming to us being of the chronic variety,—the greater portion of them at the present time, chronic amebic dysentery, although in 1900, at the time this report was made to the Surgeon General, the larger portion was the form, the pathology of which is about to be described. I have considered this form to be the chronic stage of the acute specific dysentery of tropical origin for the following reasons:

1st. The blood serum of these cases gives an agglutination reaction with a pure culture of the Shiga bacillus.

2nd. A pure culture of this bacillus has been obtained from the intestine in a few of the cases of this form of dysentery.

For convenience of description I have divided the chronic

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\*A large portion of this report is from a report submitted in 1900 to the Surgeon General of the Army on the "Pathology of Chronic Dysentery."

dysentery cases (non-amebic) which have come to autopsy here into three classes,—follicular, diphtheritic and gangrenous forms of dysentery, but it should be distinctly understood that this is only a classification from the most obvious pathological lesions present, and that in all probability the different pathological conditions present all belong to one process, commencing as follicular and terminating in the gangrenous form, providing the patient survives long enough.

The observations recorded in this report are based upon autopsy findings in 103 cases of this form of dysentery, of which 28 were of the follicular variety, 70 of the diphtheritic, and the remainder of the gangrenous. While this classification into follicular, diphtheritic and gangrenous is useful and almost necessary from a descriptive point of view, it should be understood that it is not a classification denoting disease entities, but only stages in one process. While the morbid anatomy, gross and microscopical, differs very materially, still in many cases two or more of these conditions are present at the same time. The follicular form tends to merge often into the diphtheritic, and that again into the gangrenous, so that it is at once seen that these are simply stages in one pathological process. While, therefore, we may consider that the pathological lesions found are but progressive steps in the same general process, still, there may be separated these three distinct classes from a pathological standpoint, each having its own peculiar lesions and each to be studied, in consequence, separately. In describing this form of dysentery the report will be divided as follows:

- 1st. The Character of the Dysenteric Stools.
- 2nd. The Gross and Microscopical Pathology of the Follicular Stage.
- 3rd. The Gross and Microscopical Pathology of the Diphtheritic Stage.
- 4th. The Gross and Microscopical Pathology of the Gangrenous Stage.
- 5th. The Bacteriology of Chronic Specific Dysentery.

#### THE CHARACTER OF THE DYSENTERIC STOOLS.

Much can be learned as to the type of dysentery present by a careful examination of the feces, both as regards the physical

characteristics and the microscopical contents. The stools of the three forms of dysentery noted here differ materially in macro- and microscopical appearance. We will consider each form separately.

*The Feces of the Follicular Stage:* The feces are characteristic as a whole, but it would be unsafe to diagnose this stage of the disease from an examination of the feces alone. Both the diphtheretic and gangrenous stages are evidently simply an extension of the disease process which is at first apparently localized in the follicles of the intestine. This is shown by the fact that many of the cases showing the stools of the follicular stage have, after a time, presented the characteristics found in the stools of the diphtheritic or gangrenous stages. The stools of the follicular stage exhibit macroscopically the following characteristics: In number they vary greatly, usually from three to eighteen or twenty during the twenty-four hours. There are periods of apparent improvement, during which the stools may number only one or two a day, or there may even be constipation; such periods are, however, generally succeeded by acute exacerbations, during which the stools became more numerous. They may vary greatly in character according to the food given, the amount of degenerative change occurring in the intestine, and the medicines administered. Changes in color are due to the biliary secretions and to certain drugs, such as subnitrate of bismuth.

As a rule, the stools are of a semi-fluid consistence, and where a strict milk diet is given the consistence is that of a very thin mush, milk curds being often observed. In cases upon a varied diet, the stools present particles and shreds of undigested food. The color varies greatly, some being almost white, others, and perhaps the majority, a light yellowish green, while others are gray, slate-colored, brown or dark green. In a few instances an intense bright green color is noticed. As a rule these stools show little blood, but mucus and pus are often present. As regards odor they are not very offensive.

While the follicular cases show stools of the above character most of the time, they one and all present at intervals more wat-

ery stools containing flecks and flocculi of mucus, streaked with thick, creamy pus. A few of the stools of this character show the presence of blood, and they are often frothy, being filled with gas bubbles due to fermentation. The color varies from yellow or yellowish green to reddish brown. These stools are very offensive.

During quiescent periods of the disease the stools very often are formed and resemble the ordinary movement in health. But few of the stools from this class of cases show the presence of large quantities of blood to the eye, but almost all show numerous red blood corpuscles when examined microscopically. The microscopical examination of the feces at this stage of the disease gave the following results:

*Blood:* Almost every specimen examined showed at least a few red blood cells. They were most numerous in the thin, watery discharges, and least in the formed movements. In the first mentioned they were often very numerous and well preserved in form and size. In the mushy stools, red blood corpuscles were quite numerous in some instances, while in others only a very few could be found.

*Pus:* Numerous pus cells were found in a majority of the cases examined, and they were especially in evidence in the semi-solid evacuations, although the semi-fluid gruel-like stools often contained immense numbers of pus cells. These were invariably very granular in appearance and often contained bacteria,

*Mucus and Mucous Corpuscles:* A large majority of the stools showed numbers of mucous corpuscles imbedded in a stringy, fibrous matrix, the mucus. The corpuscles were identical in appearance with leucocytes, save that they were more finely granular.

*Intestinal Epithelium:* Almost all the stools examined showed numerous epithelial cells, derived from the intestine. These occurred usually in small numbers, singly or in small groups, but in the worst cases large pieces of intestinal mucous membrane were observed, composed of a single layer of epithelial cells. These cells varied in size, possessing one or more nuclei, the protoplasm being very granular and sometimes vacuolated. Some

were so large that to one inexperienced in the examination of the feces they might easily be mistaken for amebae.

*Undigested Food:* Fragments of undigested food, such as bits of muscular tissue, various vegetable cells, milk curds, etc., were, as a rule, present. Many of the stools contained crystals of ammonio-magnesia phosphate and sulphate of bismuth.

*Bacteria:* The bacterial flora of the feces in the follicular stage of dysentery was very varied and extensive. The number of bacteria present was enormous, very much greater than in healthy feces. Staphylococci, streptococci and bacilli occurred, as well as torrulae. In all the examinations it was noticed, however, that the bacilli greatly preponderated in number, and sometimes hardly any cocci were present. A discussion of the bacteriological forms present will be reserved for the section of the report dealing with the bacteriology of the disease. Yeast cells were observed in numerous specimens, as were also mould fungi.

*Other Parasites:* In none of these cases was the ameba of dysentery observed. The cercomonas intestinalis was observed in a considerable proportion of the cases, as was also the trichomonas. These were evidently, however, only of accidental occurrence.

*Character of the Feces in the Diphtheritic Stage:* In the diphtheritic stage of this form of dysentery the stools differ much from those just described. They are composed, roughly speaking, of a serous body in which are suspended shreds, strings and pieces of pseudomembrane, epithelial cells and small portions of intestinal mucous membrane. With these are mixed blood and pus, mucus, and undigested particles of food. These stools contain but little true feculent material when the disease is progressing, but as the cases improve the movements become feculent. The mucus present is not the glairy substance seen in the stools of acute dysentery, but more closely resembles pus, which is also present in large quantities in many of these cases. The color of the stools varies from slate to red, the last being due to the presence of large quantities of blood. The most common color is a dirty brown, confined to the liquid portion of the feces, while suspended in this are the dirty, grayish yellow or greenish bits

and shreds of pseudomembrane and intestinal mucous membrane. When much blood is present the liquid portion of the stool may be dark brown or almost black in color. These stools resemble very closely those found in amebic dysentery. The characteristic features of the diphtheritic stool are the bits of pseudomembrane and portions of the mucous coats of the intestines. These pieces of pseudomembrane are derived from the diseased area in the intestine, the process there consisting in the production of a pseudomembrane over the mucous coat, resulting in necrosis of a greater or lesser portion of it. The pieces of pseudomembrane or of the intestinal mucous coats are generally very small, not exceeding  $\frac{1}{4}$  cm. in diameter. The typical diphtheritic stool consists of brownish, watery fluid in which are suspended multitudes of these bits of membrane. The odor from these stools is horribly offensive in every instance.

*Microscopical Examination of the Diphtheritic Stools:* Blood, mucous and pus cells were invariably observed in these stools. Many of the pus cells presented slight ameboid movements, when the stool was examined immediately. As a rule but little mucus was found in these stools, although pus was generally present in large amounts.

*Pseudomembrane and Portions of the Intestinal Mucous Membrane:* The microscopical structure of the pieces of pseudomembrane was that of a dimly fibrillated membrane, in which numerous leucocytes and pus cells were enmeshed. Leucocytes were, as a rule, numerous, although there were often seen bits of membrane which were granular and free from any cellular material. In all these stools there were large clumps of granular material, evidently the detritus of destroyed mucous membrane. The portions of the mucous membrane often showed the typical structure, but in a majority of the cases only the pieces of structureless membrane were to be seen.

*Bacteriology of the Diphtheritic Stool:* Here, as in the stools of the follicular stage, bacteria were present in immense numbers. Bacilli were altogether the most numerous.

The *Cercomonas intestinalis* was found in a few of the cases, but in none of them was the ameba of dysentery observed.

*Character of the Feces in the Gangrenous Stage:* This stage of the dysenteric process is simply an intense diphtheritic infection in which the mucous and submucous coats of the intestine are in various stages of gangrene, and large pieces of the diseased membrane are found in the feces, together with pus and blood. The consistence of the stools is that of thin, slimy syrup, of a slate, brown or black color, in which are found pieces of necrosed mucous membrane, often from  $\frac{1}{2}$  to  $1\frac{1}{2}$  cm. in diameter, together with particles of undigested food and greenish pus. The odor from these stools is very offensive.

*Microscopical Examination:* This showed immense numbers of blood and pus corpuscles and bacteria. The pieces of necrosed membrane comprising the mucous, and often the submucous intestinal coats, presented under the microscope, the glandular structure, more or less degenerated, of the intestine together with an immense infiltration of leucocytes. In many pieces of membrane the necrosis had gone so far as to entirely destroy all traces of structure, the result being a mass of granular detritus.

From the descriptions given of the feces in these stages of dysentery it will be seen that while each possesses characteristics of its own, yet in certain particulars there is a resemblance, indicating that it is only a step from one stage to the other, and that they are all the result of one pathological process which varies in severity. We are safe, however, in concluding that the character of the feces in a given case of dysentery is of much value in diagnosis, especially as to the severity of the pathological lesions.

#### THE GROSS AND MICROSCOPICAL PATHOLOGY OF CHRONIC SPECIFIC DYSENTERY.

In considering the pathology of this form of dysentery as observed at this Hospital, I shall describe, as accurately as possible, the appearances observed in the three stages mentioned; but while these stages differ materially when not associated, it must not be forgotten that very often a diphtheritic process is engrafted upon a follicular one, and a gangrenous upon a diphtheritic, so that we find a combination of pathological lesions

present in a single case. However, in the majority of cases observed here, the lesions have been so distinct that there has been but little difficulty in separating the cases into the three classes noted.

#### THE GROSS AND MICROSCOPICAL PATHOLOGY OF THE FOLLICULAR STAGE.

The cases of follicular dysentery were typical examples of the chronic process, there being always a history of the disease having persisted for some time, generally for several months, always for at least two months. These cases complained of but little tenesmus or general discomfort, save during acute exacerbations, which have occurred from time to time.

*Gross Pathology:* On opening the abdominal cavity in these cases the intestines were found, as a rule, dilated with gas, especially the ascending colon, as well as the ilium. In a few cases the abdominal cavity contained an abnormal amount of fluid. Abnormalities in the shape of the gut were observed in three cases, one showing a normal sized ascending and descending colon, while the transverse colon was greatly contracted, being smaller in caliber than the small intestine; one presenting a large, sacculated pouch just above the cecal flexure, and one in which the duodenum was markedly dilated along its entire course, being about three times the normal in caliber. Most of the cases showed a decidedly sacculated condition of the large intestine.

The color of the intestines externally varied somewhat, but was generally of a dull gray or slate. The large intestine was almost invariably this color, and often presented oval areas almost black in color, but these areas were not connected with underlying ulceration. However, I believe that these areas were formed ante mortem, for the reason that in the cases where they occurred the autopsies were performed very soon after death. They were probably due to extravasated blood, which, as in a bruise, is undergoing pigmentary change. In eight cases there were noticed bright red areas due to recent capillary hemorrhage.

The color of the small intestine varied from almost white to a bright pink, the most common being a bright flesh tint as a ground color from which the injected capillary vessels stood out



as brilliant red lines. In most of the cases the coats of the large intestine were thickened and the caliber of the gut lessened. In one case the large intestine was almost cartilaginous in consistence. As a rule the intestinal coats were thicker than normal throughout this portion of the canal.

One of the most remarkable conditions present, and one which was present in almost every case, was the excessive thinness of the jejunum and ilium. In some places the walls of this portion of the small intestine were so thin as to resemble parchment, and there was very extensive atrophy of the mucous membrane. In ten of the cases the solitary follicles of the small intestine were markedly enlarged.

In all but one of the cases the follicular ulceration was confined entirely to the large intestine, being limited by the ileo-cecal valve. This limitation was very noticeable in cases where the ulceration was very extensive right up to the valve, but there abruptly ceased. In one case there was a large ulcer about two inches above the valve, and the solitary follicles in the vicinity were enlarged. The stomach in almost every case was smaller than normal, and the entire organ of a dark slate color. The mucous membrane was very pale and poorly supplied with blood. In these cases the stomach was very greatly atrophied, its walls thickened, and the mucous membrane showing extensive chronic inflammation. In all the cases the mucous membrane of the stomach showed some inflammation, generally of a chronic character.

The color of the diseased membrane in the large intestine varied considerably, but the most common was a gray slate color; brownish pigmented areas were observed frequently, and also patches of acute congestion. In those cases where there was but little ulceration, the mucous membrane appeared thickened, while the follicles stood out as slightly enlarged and tumefied areas, around the bases of which was often observed evidence of acute congestion in the shape of a reddish circle, due to the congested capillaries. Cystic formation was not observed in any of these cases. In this stage of the disease the pathological process seems to be confined to the follicles of the large intestine. Where fol-

licular ulceration had commenced, the mucous and submucous coats were markedly thickened, as a rule, the thickening being confined, to a great extent, to the submucous coat. The caliber of the gut was generally lessened, but in places there was marked dilatation. In such cases the dilated portion was almost white, there being but little pigmentation, but the thickened portions of the gut were often pink or reddish in color. The ulcerations in the follicular stage are absolutely characteristic. They were situated in the early stage at the summit of the follicles, and appeared first as minute ragged openings, so small that close inspection was needed to see them. As the process advanced, the adenoid tissue of the follicle broke down, the ulcer became larger, had undermined edges, and a greater diameter at the bottom than at the top. These ulcers may run together in the worst cases, thus forming irregular channels through the mucous membrane. The surface of the gut around the smaller ulcers was not congested, but around the large ones there was generally a slight congestion. A peculiar characteristic of these ulcers was their stamped-out appearance, as though they had been cut into the mucous membrane by a sharp punch. The largest single follicular ulcer observed measured  $1\frac{1}{2}$  cm. in diameter, but, as a rule, they measured from  $\frac{1}{8}$  to  $\frac{1}{4}$  cm. in diameter. The floor of these ulcers, save in the very early stage, was generally the submucous or muscular coat. In the early stage the floor was generally formed by the submucous coat or by the remains of the adenoid tissue of the follicle. Cicatrices due to the healing of these ulcers occurred in about 25% of the cases, but were by no means numerous.

In three of the cases the diphtheritic process had commenced shortly before death, being engrafted upon the follicular condition. In these cases the colon, especially the rectum, was of a dirty greenish gray color patched with red. There were numerous areas covered with pseudomembrane, which, upon being removed, disclosed small follicular ulcers.

As regards the seat of the process, in the large intestine, the region around the ileo-cecal valve was most often and most extensively involved, the next most frequently involved region being the rectum. In the majority of cases both these regions were

involved. Above the splenic flexure for some 20 or 30 cm. the mucous membrane in most of the cases was but little involved. In four of the cases the rectum and cecum were alone involved.

*The Small Intestine:* The small intestine in every case showed a remarkable thinning of the coats, especially in the ilium. The latter portion of the intestine was often almost like tissue paper. The color of the ilium in these cases was white, or at most very slightly pink. The mucous membrane in the thin portions was generally entirely atrophied, while in those portions in which the coats were thicker, the mucous membrane was present but evidently ill-nourished.

The mucous membrane of the duodenum and the jejunum was more normal in appearance, but there were usually patches of acute congestion and capillary hemorrhage. In six cases the ilium contained minute pigmented areas.

*The Microscopical Pathology of the Follicular Stage:* In describing the microscopical pathology in this stage of dysentery I shall not touch upon those cases in which the diphtheritic process began before death, as the pathology of that condition will be considered in its proper place; nor upon the bacteriological conditions, which will also be referred to later. In studying this subject we meet with changes in the following structures, i. e.; mucous coat, submucous coat, muscular coats and the peritoneal coat. I shall first describe the changes which take place in the intestinal coats where ulceration has not begun.

*The Mucous Coat:* The cellular elements of the adenoid tissue were increased in number, so much so that the tubular glands were compressed, and in some places seemed to be filled with a dense mass of leucocytes. The adenoid tissue in places had entirely replaced the glandular tissue. Scattered through the dense adenoid tissue was much brownish and black pigment. The nuclei of the cells stained very deeply.

*The Submucous Coat;* The submucous layer of the intestine was generally much thickened and infiltrated by leucocytes. The latter were collected in irregular masses, being especially numerous nearest the solitary follicles. The muscular layers of the mucosa were often entirely obscured by the masses of leucocytes.

The solitary glands or follicles were somewhat enlarged, the number of cells being notably increased, and surrounding them were numerous leucocytes. The follicles projected markedly into the mucous layer, and in some places beyond it.

*Muscular Coats:* The muscular coats presented some leucocytic infiltration, the leucocytes being most numerous in the circular coat, least in the longitudinal.

*The Serous or Peritoneal Coat:* No change of importance was detected in this coat. Where follicular ulceration had occurred, the following changes were noticed:

*The Mucous Coat:* There was a great increase in the cells of the adenoid tissue lying between the tubular glands. These cells produce two different results, either they pushed or crowded the tubular glands upward or they invaded them, causing their ultimate destruction. Where the latter process occurred, superficial ulcerations in the mucous membrane were formed, in which a portion of the glandular structure was destroyed, the edge of the ulcer being marked by a dense layer of leucocytes beneath which were often observed portions of the glandular structure still intact. These ulcers were not follicular, but almost always occurred along with follicular ulcerations. In two instances the non-follicular ulcerations just described had assumed the more intense character of ulcers penetrating to the muscular coat, the mucous and submucous coats being entirely destroyed. The edges of such ulcers were sloping or ragged, and composed largely of dense swarms of leucocytes. The submucous and muscular tissue surrounding these ulcers were also invaded by leucocytes.

In some portions of the mucous membrane the tubular glands were much deformed, being shortened or obliterated by the pressure of the increased adenoid tissue, while in other places the glands were entirely filled with leucocytes.

*Submucous Coat:* The first thing which attracted the attention in sections of the large intestine, from cases of follicular dysentery, was the immense thickening of the submucous coat. In the majority of the cases observed here it constituted at least  $\frac{1}{2}$  the entire thickness of the gut, and sometimes nearly  $\frac{3}{4}$ .

This great increase was due to the invasion of the tissue by immense numbers of leucocytes, and the active proliferation of the connective tissue cells.

In studying the sections, the distribution of the new cellular material was found to be somewhat peculiar. Around the solitary follicles the leucocytes were present in immense numbers, often entirely obscuring the follicle. Beneath and within the muscularis mucosae they were very numerous and greatly decreased in number as the muscular layer of the intestine was approached. The blood vessels of this portion of the intestine were, as a rule, but little congested, but their walls often showed some fibroid thickening. In a few of the sections there were noticed peculiar areas as having a homogeneous appearance, taking the stain but poorly, and in which no definite structure could be demonstrated. These were probably areas of coagulation necrosis.

*The Solitary Follicles:* It was in these structures that the most characteristic lesions of this stage of the disease were found. The first evidence seen in the sections of the ulcerative process as it affected these glands, was a breaking down of the cellular structure of the gland at the portion nearest the mucous membrane, that is, at the apex of the follicle; the cubical layer of epithelium had disappeared and the proliferated adenoid tissue had taken its place. At the same time a great accumulation of leucocytes had occurred around the follicles.

Where the process was a little more advanced, there was a marked excavation of the follicle, the mucous coat forming an overhanging edge, while the necrosis proceeded laterally in the submucous tissue. In some sections this process could be seen to have advanced until the circular muscular coat had been reached, the floor of the ulcer being formed by it. Such an ulcer presented an excavated edge formed by the mucous and submucous coats, which were infiltrated by dense masses of leucocytes, the floor being formed by the circular muscular coat, which also showed marked leucocytic infiltration. All stages of the process were traced, from the ulceration of a portion of the solitary follicle to its entire destruction, and the consequent spread of the ulcerative process through the submucous and muscular coat. In some of

the sections the ulcers were seen to have joined, forming large irregular cavities involving most of the mucous and submucous coats. In none of the sections could the ulceration be seen extending more than half way through the circular muscular coat. The margins of some of the ulcers showed a very great degree of excavation, the mucous coat forming a very marked overhanging edge, and in some of the solitary follicles it was observed that the tubular glands had apparently become incorporated with them, forming cyst-like cavities in the dense mass of the adenoid tissue of the follicle. Besides the immense accumulation of leucocytes and connective tissue cells in the margins of the ulcers, such cells were especially numerous around the blood vessels and at the muscularis mucosae. Some of the sections showed extensive hemorrhagic areas in the submucous coat, due to the destruction of the capillary vessels in the vicinity. Large collections of golden brown pigment were often seen lying in the submucous coat and nearer the margins of the ulcers, and also areas of fatty degeneration, especially numerous at the junction of the mucous and submucous coats.

*Muscular Coats:* The circular muscular coat was invariably found invaded by leucocytes, but sometimes in very small numbers. The leucocytes were present in immense numbers wherever the ulcer had penetrated to the muscular coat, and in large numbers in those cases where the ulceration had nearly reached the circular fibers.

The longitudinal muscular coat generally showed a slight infiltration of leucocytes, and in those cases where an ulcer had penetrated partly through the circular layer of muscular fibers, the leucocytic infiltration was much more marked. In such sections the muscular tissue near the advancing edge of the ulcer was invaded by a dense mass of leucocytes and connective tissue cells, most numerous the nearer we approach the ulcer. The floor of the ulcer was irregular and composed of broken down and degenerated muscle fibers and masses of leucocytes, together with granular detritus.

*The Serous or Peritoneal Coat:* Some thickening of this coat was generally observed where ulceration had occurred, together with a slight leucocytic invasion.

From the study of the pathology of the follicular stage of chronic specific dysentery, it will be seen that the process consists essentially in a necrosis and ulceration of the solitary glands or follicles of the large intestine, with an extension of the process to the mucous and submucous coats and sometimes to the muscular coat; superficial and sometimes deep ulceration, non-follicular, of the mucous and submucous coats, and invasion of the mucous, submucous and muscular coats by immense swarms of leucocytes and connective tissue cells, leading to atrophy and loss of function of the tissues affected.

It should be remembered that any or all of the pathological lesions described may be present in the same section, as for instance superficial non-follicular ulceration with deep follicular ulceration but, however combined, the separate pathological lesions conform to the descriptions given, and are always to be observed in sections of the large intestine from cases in the follicular stage of this disease.

#### THE GROSS AND MICROSCOPICAL PATHOLOGY OF THE DIPHThERITIC STAGE.

In this stage of dysentery the pathological lesions may be divided into three classes, *i. e.* ; involvement of the mucosa without any diphtheritic deposit; involvement of the mucosa and a deposit of diphtheritic exudate, upon the surface of the membrane; involvement of the mucosa, submucosa and even the muscular coat, with coincident diphtheritic deposits upon the surface of the mucous membrane. Often all three of these lesions were present in the same case, while in others one only was present. This stage of the disease was altogether the most common in cases dying at this Hospital at the time this report was made in 1900.

*The Gross Pathology of the Diphtheritic stage:* The intestines upon inspection were generally dilated with gas, and the small intestine of a leaden gray or very pale flesh color. The large intestine was generally of a grayish or greenish blue color externally, marked here and there by red or dusky brown spots, indicating the more advanced diseased areas within. Seldom was the intestine found at all cartilaginous in consistency, although it was always much thickened.

Abnormalities in the shape of the large intestine were always present, there being numerous dilatations, while in other places the intestine appeared contracted. This contracted appearance of the intestine was generally most marked at the lower portion, while the dilatations were most frequent in the transverse and ascending colon. The thickening of the intestinal coats gave the intestine a peculiar feel. The walls of the small intestine were almost invariably thinned.

The stomach presented externally little of interest, being either pale in color and dilated with gas, or presenting numerous reddish areas and more or less atrophied.

When the intestine in these cases was opened, the appearances presented varied much, depending upon the stage at which the disease process had arrived before death. In six cases, where the disease had invaded only the mucosa and there was no production of a diphtheritic deposit upon the inner surface of the intestine, the mucous membrane appeared thickened and velvety, and was of a dusky reddish color with lighter areas of more normal tissue scattered here and there. This appearance was confined to the rectum and around the ileo-cecal valve, the mucous membrane of the rest of the large intestine being more normal in appearance. Although no diphtheritic deposit was present in these cases, ulceration had occurred, the membrane having become necrotic and thrown off as a small slough. Such ulcers were irregular in shape and very superficial. While upon inspection no ulceration apparently existed in some of these cases, incision through the mucous membrane often disclosed small ulcer cavities within the mucosa. In these cases also there were numerous elevations noted on the mucous membrane, which upon incision were found filled with a rather thin glairy substance which was almost colorless. These were very similar to those found in amebic dysentery but much smaller.

In those cases, comprising the great majority of the ones autopsied here, where the mucosa was not only invaded but a diphtheritic deposit was formed over it, the most characteristic appearances accompanying this stage of dysentery were obtained.

The color of the interior surface of the intestine varied with the amount of exudation deposited. In the worst cases, where



the entire surface of the intestine was covered, the color was generally a dirty greenish gray or white; in the cases where the diphtheritic deposit occurred in patches the color of the intestine varied from a dusky red to a livid bluish tint, spotted with dirty white or grayish membrane. This membrane microscopically is seen to consist of a granular material enclosing numerous leucocytes and immense numbers of bacteria.

In a few of the cases the internal surface of the intestine presented bright red areas, in these regions the inflammation being acute. In all the cases, the mucous membrane of the rectum, where it was not covered with exudation, was of a peculiar dusky red and very velvety in appearance.

As a rule the diphtheritic membrane occurred in irregular patches, varying in size from  $\frac{1}{4}$  cm. in diameter to areas covering several cm. In all the cases showing the diphtheritic membrane, sloughing had occurred in many places, either in patches, leaving superficial ulcerations, or in the form of strings or shreds, leaving fissures and hemorrhagic streaks through the mucous membrane. Shreds of nearly detached membrane were always found in these cases, giving the intestine a very characteristic and shaggy appearance, somewhat like those observed in amebic dysentery.

All of the cases showing a diphtheritic deposit presented numerous ulcerations, due to the destruction and sloughing of the diseased mucosa and submucosa. These ulcers were often very characteristic. They varied greatly in size, from fine, pin-head excavations to ulcers measuring one or two cm. in diameter. In all the cases they were superficial, not extending deeper than the submucosa, not one case showing an ulcer extending to the muscular coat, although in many cases the process had nearly penetrated through the submucosa. The edges of these ulcers were not abrupt or overhanging, but sloped gradually down to the base. The color of the mucosa between the ulcers was a pale flesh tint, with patches of dirty gray or greenish membrane. In shape the ulcers were generally round or oval, the latter most common, although irregular ulcers were often observed. In most of the cases the bases of the ulcers presented minute specks or

dots of brownish pigment, probably due to degenerated blood which had been extravasated. The false membrane was usually quite tenacious and tough, but in some cases was very easily detached. In all the cases the deposit of diphtheritic membrane was greatest in the rectum and just below the ileo-cecal valve. I have seen but two cases here where the membrane had passed above the valve into the ilium. In four of the cases the rectum alone showed the presence of the diphtheritic membrane, although the remainder of the large intestine was inflamed and tumefied. Cicatrices of ulcers were not often observed.

Internally the small intestine presented patches of more or less acute inflammation and areas in which the mucous membrane was almost completely atrophied. In most of the cases a peculiar hyperaemic condition of the summits of the folds of the mucous membrane was noted, the capillaries in this locality being apparently greatly congested. The mucous membrane of the stomach presented, in all the cases, more or less evidence of chronic inflammation as shown by atrophy of the mucous membrane, patches of congestion here and there and pigmentation.

*The Microscopical Pathology of the Diphtheritic Stage :* In attempting to interpret the microscopical appearances found in sections of the intestine in this stage of dysentery, it should be remembered that all the lesions presented are merely steps in one process, that no new histological elements are imported into the diseased tissue, and that in a single section may be seen the lesions of one or more stages of the disease. The process is essentially a coagulation necrosis of the mucosa and submucosa, the necrosed tissue sloughing off and leaving superficial ulcers.

Sections of the intestine from the very earliest stage of the process, before the production of false membrane, present the following appearances, not varying much from the appearances noted in the follicular stage of the disease.

The columnar epithelium covering the intestinal mucosa and lining the glands had disappeared. The adenoid tissue between the glands of Lieberkuhn was infiltrated by a dense mass of leucocytes, which had in many places invaded the glands and distorted them or pushed them widely apart. At this early stage the

leucocytic invasion had only penetrated to the muscularis mucosae, which seemed to limit it. Where the process had further advanced, however, the leucocytes could be seen to have penetrated beyond the muscularis mucosae into the submucous coat, being especially numerous around the follicles of the intestine. A lesion of peculiar character and of great interest during this stage was the formation of small ulcers beneath portions of the mucosa, often not extending into the submucosa. Numerous areas were noticed in which small cavities were seen entirely surrounded by the mucous coat in which they lay, the tissue surrounding these cavities being densely infiltrated by leucocytes, and the glands of Lieberkuhn in the neighborhood entirely obliterated by vast numbers of the leucocytes. It is only a step from this lesion to the fully developed superficial ulcers, all that is necessary being the necrosis and sloughing of the thin covering layer of adenoid tissue and leucocytes, when the typical pseudo-diphtheritic ulcer will be produced, with its sloping or rounded edges and smooth floor formed by the submucous coat. In sections from the intestine where the pseudo-diphtheritic membrane had already been formed, a somewhat different appearance was noted. Lying upon and within the glands of Lieberkuhn and penetrating more or less between them was a dense, fibrillated material containing numerous blood corpuscles, leucocytes and bacteria, *i. e.* false membrane. There was the same increase in the elements of the interglandular adenoid tissue, and the same infiltration by leucocytes, previously noted. Where the process has still further advanced, the submucosa was invaded by masses of leucocytes, the capillary vessels distended with blood, and numerous capillary hemorrhages had occurred throughout the submucosa and also the mucosa. The leucocytes were especially numerous around the solitary glands, many of which had entirely disappeared, being replaced by dense masses of these cells. The muscularis mucosa had entirely disappeared, and there seemed to be an increase in the fibrous material of the submucosa. The circular muscular coat was generally more or less infiltrated by leucocytes and connective tissue cells. This great accumulation of leucocytes and the pressure exerted by them and the new-

ly formed diphtheritic membrane, together with bactericidal poisons, leads inevitably to tissue necrosis and sloughing and the production of ulcers, which, in the cases observed here, never penetrated to the muscular coat.

Sections of the intestine where such ulceration had occurred, presented the following appearances. The base of the ulcer was formed by the submucous coat and was usually quite smooth, the edges were sloping and formed by the mucosa. These edges were densely infiltrated by leucocytes. The submucosa in the neighborhood of the ulcer contained vast swarms of leucocytes, and the blood vessels were dilated and filled with blood. In some sections the slough could be seen just before becoming detached from the resulting ulcer, being composed of degenerated leucocytes and granular detritus.

In many sections the pseudo-membrane covering the surface of the mucosa was very thick and almost homogeneous in structure. In such cases it often formed a layer nearly as thick as the combined mucous and submucous coats.

#### THE GROSS AND MICROSCOPICAL PATHOLOGY OF THE GANGRENOUS STAGE.

This stage of chronic specific dysentery may perhaps be regarded as a very intense type of the diphtheritic stage, or simply the further development of that stage. It is characterized by almost total destruction of the mucous and submucous coats of the large intestine, these coats having become a mass of gangrenous tissue streaked with greenish pus, and from which a terrible odor is given off. In this stage the patient often has general septicemia, metastatic abscesses being found in other organs, especially the lungs.

*Gross Pathology of the Gangrenous Stage:* The intestines were found matted together when the abdominal cavity was opened, and could only be separated, without tearing by the use of great care. The large intestine was found to be almost necrotic, tearing if the least traction was exerted upon it. The color externally was greenish black; with irregular areas, inky black in color, scattered over it, corresponding to areas within the intestine where the mucous, submucous and portions of the muscular

coats had been entirely removed by gangrene. The rectum and sigmoid flexure were of a nearly uniform dark olive green color, and these portions of the intestine were markedly contracted and distorted in shape. The region around the ileo-cecal valve was greatly sacculated.

The notable feature of the external appearance of the large intestine during this stage was the presence of numerous tumified elevations projecting through the peritoneal coat, and which when incised were found to be filled with a purulent exudate. These nodules appeared to be cystic cavities in the muscular coat of the intestine, which were filled with pus.

In a few places the walls of the large intestine were thickened, but as a rule they were thinned and very fragile in consistence. Externally the small intestine was of a reddish color with numerous areas of bile-stained tissue. The walls of the small intestine were very thin and easily ruptured.

The stomach was dilated, as a rule; of a greenish blue color, and the walls thin. There were numerous pigmented areas present in the walls of both the small intestine and the stomach.

Internally, the appearances presented in the large intestine were so varied that a detailed description of them is exceedingly difficult. The color of the mucous membrane varied, in some places being reddish brown, in others greenish, yellow or bluish, according to the stage of the gangrenous process. In the rectum and sigmoid flexure the color was a greenish black, streaked here and there with yellowish green pus. Nearer the ileo-cecal valve the ground color was a dusky red, with greenish and brownish areas where gangrene had advanced more rapidly. The surface of the rectum and sigmoid was bathed with a thick, yellowish green pus, and showed, here and there, deep, irregular ulcerations with excavated edges, the floors covered with shreds of blood and pus-stained tissue. In some places there were marked rugae formed, while in others small nodules and great tumefaction of the membrane was noted. This condition resembled markedly the advanced stage of amebic dysentery. There were numerous large areas in which the mucous membrane was entirely destroyed, as well as the submucous and a portion of the

muscular coats. Such areas were of a livid blue color, and shreds of necrotic tissue were attached to them. In other places the mucous and submucous coats were reduced to a greenish black mass, blood-stained in places, and from which a yellowish green pus exuded upon the least pressure. This condition was especially noticeable in the rectum and around the ileo-cecal valve. Tumefied areas were observed, which when incised exuded pus and a semi-translucent glairy fluid resembling gelatine.

There were no distinct ulcers observed in the rectum or cecum where the gangrenous process was most intense, but in the transverse colon there were numerous ulcers varying in size and shape. A few were oval, situated transversely, as in the case of tubercular ulcers, with undermined edges and floor formed by the circular muscular coat. These varied in size from  $\frac{5}{16}$  to 2 cm. in diameter. There were also large irregular ulcerations with tumefied, undermined or sloping edges formed by the separation of large sloughs. The floor of such an ulcer was formed invariably by the muscular coat and was not smooth but covered with stringy shreds of necrosed tissue. A very few minute follicular ulcers were observed.

In those portions of the mucous membrane where gangrene had not as yet commenced, numerous superficial ulcerations were observed, situated in the thickened and dusky red mucous membrane. These ulcers were irregular in shape and only involved a portion of the mucous coat being similar in all respects to those found in the diphtheritic stage. In two of the cases observed here the mucous membrane of the ilium was partly gangrenous, being covered with necrosed tissue and pus, and showing a few irregular ulcers extending to the muscular coat. In all the cases the mucous membrane of the small intestine showed a severe chronic enteritis. The stomach presented areas of acute inflammation, alternating with atrophic patches from which the mucous membrane had entirely disappeared.

#### THE MICROSCOPICAL PATHOLOGY OF THE GANGRENOUS STAGE.

It is an exceedingly difficult task to attempt to describe all the varied appearances presented microscopically in this stage of

dysentery. I shall only touch upon the most salient features which are of importance in understanding the pathological process, which is undoubtedly due to the invasion of the structures by immense hordes of micro-organisms.

Sections through the rectum, where the gangrenous process was most advanced, showed almost nothing but a mass of leucocytes, red blood corpuscles and granular detritus. Such sections presented here and there broken down muscular tissue and the remains of the longitudinal muscular coat of the intestine. The mucous, submucous and circular muscular coats had been destroyed, all remaining of them being the mass of exudation mentioned. In sections through a portion of the intestine showing the irregular ulcers spoken of, the following appearances were noted: The mucous coat was covered with a diphtheritic membrane consisting of fibrillated material and leucocytes, while the glands of Lieberkuhn and the adenoid tissue between them were filled with an exudation composed of leucocytes, red blood corpuscles and granular detritus. The ulcerations present were irregular in shape, with excavated edges, and penetrated to the muscular coat, their floors being irregular, showing small elevations, ragged in outline, composed of fibrillated material in which were numerous leucocytes and blood corpuscles.

The submucous coat, where no ulceration was present, was invaded by immense numbers of leucocytes. The blood vessels were dilated with leucocytes and red blood corpuscles, and numerous hemorrhagic areas had formed throughout this coat. The muscularis mucosae had entirely disappeared.

The muscular coats were greatly thinned, there being many areas of dense leucocytic infiltration, especially numerous around those places where ulceration had reached the muscular coat. There were also seen the peculiar cystic cavities previously noted, which were filled with innumerable leucocytes, these cavities lying between the muscular fibres. As will be seen, the very early stage of this process does not differ materially from the diphtheritic stage. The great infiltration of all the coats of the intestine by pus in this stage of dysentery is evidenced by the immense leucocytic invasion, which is marked even in the longi-

tudinal layer of the muscular coat. This invasion causes thickening of these portions of the intestine, but where the gangrenous process had advanced, the intestinal coats were greatly thinned, owing to the rapid and extensive destruction of tissue, there being no new tissue formed to replace that destroyed. While the gangrenous process always predominated in the pathological picture, there were areas of more acute inflammation scattered here and there throughout the intestine. The amount of pus which bathed the interior of the intestine in these cases is remarkable, and it is obviously impossible that such a condition could exist long without perforation resulting. In summing up the pathology of the three stages of dysentery described, it will be seen that in reality the condition is one progressing from the follicular stage to the gangrenous. The follicular ulcer becomes covered with a diphtheritic exudate, and this exudation, increasing, causes the necrosis of the underlying tissues.

#### THE BACTERIOLOGY OF CHRONIC SPECIFIC DYSENTERY.

In considering the question of the etiological relation of bacteria to this form of dysentery a most complex problem is at once presented, but one which has, by the labors of Flexner, Curry and Strong, been solved apparently, as far as the acute stage of the disease is concerned. It is much more difficult to be sure of our etiology in the chronic form which has here been described. In the feces and in the diseased intestine all classes of bacteria are found. To isolate and actually demonstrate from these great swarms of organisms the one really the cause of the disease is a task of the greatest magnitude, and I have been able in only three of the cases described here to separate the bacillus first described by Shiga and studied so thoroughly by the observers noted. While this bacillus is undoubtedly the cause of the acute form of the disease, in the chronic form we have to deal with such a multitude of organisms which are pathogenic, especially the staphylo- and streptococci, that it is difficult to say how much of the pathological condition present is due to Shiga's bacillus. It seems more probable that not one but perhaps many bacteria are associated in the production of the pathological lesions found. Not only is this so, but even in the acute form of the disease it



seems somewhat doubtful what cause is really at the bottom of the initial production of the disease. While I have not been able to obtain cultures of Shiga's bacillus in most of the cases autopsied here, I have used pure cultures of this bacillus in testing the action of the blood serum of these cases, and in all have obtained a marked agglutination reaction. This reaction has not been present in cases of amebic dysentery so far as I have been able to discover, and I feel justified in believing, for this reason, that these cases are the chronic form of the acute specific dysentery prevalent in the Philippines. I shall not enter here into a description of the bacillus of Shiga, but would refer the student to the excellent descriptions of Flexner, Curry and Strong. As regards bacteria in the sections of the large intestine, it may be said that such organisms are always present, but their number varies with the particular stage of the disease studied. It may be stated broadly that the bacteria are less numerous in the follicular stage and most numerous in the gangrenous. In the follicular stage, as in all the stages, the bacteria seem to invade the tissue of the intestine by means of the lymphatic channels. Numerous bacilli and micrococci were to be seen lying between the tubular glands and sometimes within them. No one species seemed to be in the ascendant, there being a decidedly mixed invasion, bacilli and micrococci being scattered in bunches and clumps throughout the tissue of the mucous coat. Around the follicular ulcers, which had penetrated to the submucous coat, bacteria were numerous, especially just beneath them. The most numerous were micrococci, but small clumps of bacilli could be seen here and there, but it was only very rarely that bacteria were seen beneath the muscular coat in the follicular stage. In the diphtheritic stage bacteria occurred in varying numbers in the following situations: the diphtheritic membrane, the mucous, submucous and circular muscular coats. Immense numbers of bacteria, (micrococci and various forms of bacilli) occurred in the diphtheritic membrane. In the mucous membrane large numbers of micrococci and bacilli were found; in all the diseased tissues the micrococci preponderated in number. Besides this, wherever there was diphtheritic membrane within the tubular glands it was crowded with bacteria

Wherever ulceration had taken place, the tissue forming the walls of the ulcer was crowded with bacteria, chiefly micrococci, which had also invaded the surrounding tissue for a variable distance. In the submucous coat there were many clumps of bacteria situated between the bands of connective tissue, in the lymphatics, and wherever ulceration was present, in the tissue forming the walls of the ulcer. Micrococci were more numerous than bacilli in these situations, but both forms occurred. In the circular muscular coat clumps of bacilli and micrococci were seen, especially where an ulcer had penetrated to this coat. They appeared to lie between the muscular fibers, probably within the minute lymphatics, and were not very numerous.

In the gangrenous stage bacteria occurred in immense numbers in the sloughs and in the diseased coats of the intestine. Here the bacteria seemed to be diffused more generally throughout the tissues. In the gangrenous stage, as well as the diphtheritic, where hemorrhage had occurred, bacteria were seen to be very numerous around the hemorrhagic areas, and many of the minute capillaries were crowded with them. This condition of the crowding of the capillaries with bacteria was especially common in sections from the gangrenous cases, and as these cases often presented multiple pyemic abscesses in the lungs, it is probable that the blood carried to these organs the infective material from the intestine. In general, it may be said that in the superficial mucous coat bacilli and micrococci were present in nearly equal proportion in all the stages of dysentery, but the deeper we go, the more numerous are the micrococci; thus, in the submucous and muscular coats the micrococci, especially streptococci, far outnumber the bacilli, which occurred but rarely. The microbic infection is least in the follicular form and greatest in the gangrenous.

*Conclusion:* In closing this report on the pathology of cases of chronic specific dysentery it will be seen that the term "tropical dysentery," as denoting dysentery due to infection with the ameba, is unwarranted, in the sense that amebic dysentery is the only type occurring in the tropics. All of these cases originated in the tropics and are as really tropical as amebic dysentery. However both forms occur in temperate regions and the term "tropical dysentery" should be discarded.

## THE JAPANESE AS MILITARY SANITARIANS.

By LIEUTENANT COLONEL JOHN VAN RENSSELAER HOFF

DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY.

**T**HE war in the East to determine whether the Orient shall be dominated by Russia or Japan, or whether China is to be divided among the nations of the earth until she is regenerated, makes of interest anything regarding the opposing armies, especially that of Japan.

It was the writer's privilege during a short service in China to observe the Japanese troops and, like every one else, to be impressed with the wonderfully systematic way in which they did everything. This was so marked as to raise the question as to whether it was purely imitative, or whether behind it there was the initiative needed to make an army effective. But one had only to observe what they did in the march to Peking to be convinced that there was no lack of initiative, even if their war with China had left that question in doubt, while since then their enterprise has astonished the world.

Speaking of the Chino-Japanese war, Admiral Fremantle, R.N., remarked that the principal lesson to be learned from that remarkable conflict is ethical. "It lies deep in the traditions and temperaments of the two nations. The warlike go-ahead Japanese have won all along the line, while the peaceable, conservative Chinese have disastrously failed to make any respectable defense of their hearths and homes."

But it seems to me that the most important military lesson to be learned from the war, and which is apparently to be emphasized in this, is one that we of a boasted higher civilization cannot afford to ignore, namely, the value of organization and preparation. It was these and certainly not individual physical superiority which enabled forty million "wojen" (dwarfs) to easily overcome a nation ten times more numerous.

It will be recalled that less than half a century ago the Japanese finally concluded to adopt western civilization. That they might know what this civilization really was, they sent out commissions to visit all the great nations and bring back that which was best.

In this pilgrimage it was found that France had the best army (views modified after the war of 1870), England the best navy, and the United States the best public school system, and these are the models on which Japan organized her public schools, her army and her navy.



**The Japanese Army Hospital at Chemulpo.**

*(Reduced from Collier's Weekly.)*

The admirable organization of the Japanese army extends equally to its sanitary department, for, though their national commission found among us no religion they could recommend or adopt, yet humanity seems to have been recognized by this people; in any event, they realized, humanity aside, that a properly organized sanitary department was absolutely essential to the effectiveness of an army, and, with their usual promptitude, organized one which in personnel, material and efficiency leaves little to be desired.

The present Director General of the British Royal Army Medical Corps, who was an interested observer of the practical working of the medical department of the Japanese army during the war of 1894, says in a most valuable report, from which I shall borrow freely, we failed to realize regarding this people "that Japan had physicians and surgeons of the highest standing, many of whom had taken highest honors in American and European schools, and some of them were and are pioneers in bacteriology and other branches of scientific research."



**Japanese Red Cross Nurse Attending Russians Wounded in the Battle of Chemulpo**  
[Reduced from *Collier's Weekly*.]

A lack of general knowledge of this fact, was the occasion of the surprise to those who had expected to find a crude sanitary organization, and instead found one fully abreast of the latest developments in this direction.

The May issue of this JOURNAL sets forth in detail the organization of personal and material for the various medical units of the Japanese Army, as reported by Colonel Taylor, and no further reference to them here is necessary. Suffice it to say that

from the actual fighting line through the regimental aid stations, the collecting and dressing stations, the field hospitals, the railroad, boat and ship hospitals, the stationary hospitals on the lines of communication and at the base, each stage of the wounded man's journey is provided for by the most careful and detailed organization, and so far as human intelligence can anticipate, absolutely nothing is left to chance.

It has become so much the vogue for writers to prate about the terrific casualties of future wars, even going so far as to predict that because of the estimated destructiveness of modern ordnance a battle would be too frightful to be endured, and consequently wars would cease, that the unthinking have almost been brought to believe that we have been fired into the millennium by dynamite. However, nature has not yet changed. From the lowest protoplasm to the highest organic development there is endless strife, and man remains, under certain conditions, quite as much of a fighting animal as even his bestial progenitors.

In truth those who seek for perpetual peace, have failed to reckon with the man rather than the gun, and have overlooked the fact so well stated by Forbes, "that the more modern battles of Europe, in which great numbers of men have been engaged, battles in which were used rifled cannon and small arms, have afforded greatly less percentages of casualties than those of earlier battles in which smooth-bore cannon and muskets were the sole weapons of fire."

While the Chino-Japanese war could in no sense be regarded as typical of what the conflict with Russia will be, yet it incidentally taught certain lessons of universal application, and some of which are of especial value to the military sanitarian.

Not the least important and interesting of these lessons is found in what the youngest child of our boasted civilization has done in organizing to care for the sick and wounded, and, regarding it from its purely military standpoint, what this organization has accomplished for the fighting machine in keeping its front unhampered by invalids.

Referring to organization Colonel Taylor wrote, "At Port Arthur there were opportunities of seeing how every part of the

medical machine worked \* \* \* \* in the fighting line everything was done that could possibly have been done. Lives were saved on the spot where the men fell, by the prompt application of tourniquet and even large arteries were ligatured under heavy fire. I saw two men brought back from the dressing station from the line of attack on one of the forts, both of whose lives were saved by ligature, one of the femoral, another of the axillary artery; the 'tallies' in each case gave the particulars of what had been done under difficulties, but with every care, and asked for immediate attention to the wounds which had been protected by the first dressing. The wounded were removed from the field without any delay just as quickly and quietly as they always were on the bi-weekly parades of the bearer columns in time of peace. If regiments were engaged far ahead, the regimental bearers did the work until the bearer companies came up, when they again took their places in the ranks. There was no loss of time, the medical officers were everywhere" \* \* \* \* . And thus he goes on describing most graphically what he actually saw, no wounded left for hours unattended, no waiting for the battle to cease. I quote again, "At Wei Hai Wei on the 30th of January the steadiness which results from drill, or practice, was demonstrated in a splendid manner. A regiment which in forgetfulness of the warning of the Marshal commanding in his orders of the night before, that troops were not to be exposed on the beach of the harbor for fear of drawing upon them the fire of the Chinese ships still there, and in the excitement of the pursuit of thousands of the enemy in flight, advanced across the flat, sandy beach for some distance and suddenly found itself under fire from the quick-firing and machine guns of the Chinese ships and from torpedo boats at a distance ranging from 200 to 600 yards \* \* \* . The regiment which was in line was taken in the flank, and at the first discharge over 80 men were down, and the saddles of the (2) mounted officers were empty. It was evident that the regiment was in danger of being soon annihilated, but someone had his wits about him, for in a few seconds every man was on his face, and soon all were crawling or making rushes, while stooping, towards a ravine to their left. There the regiment reformed, but

even while the men were creeping away we saw suddenly the medical officers and stretchers spread over the field at some distance from one another. They walked in that storm of bullets as quietly as if on the parade ground at Tokio \* \* \*. In twenty minutes there was not a dead or wounded Japanese soldier on the beach." What a contrast this actual experience is with the picture of future battles recently drawn by a distinguished writer, who says, "the victor will hasten away \* \* \* leaving the wounded of both sides to be dealt with as may be possible by such surgeons as he can afford \* \* \* and to the ministrations of cosmopolitan amateur philanthropists of the Red Cross and kindred organizations, for there will be no more military bearer companies," etc.

A wonderful people the Japanese, intelligent, loyal, brave, and in nothing are these qualities better illustrated than in the organization and practical working of their military sanitary department. The whole army, indeed the whole country, sympathized with the work and with such support success was assured.

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#### NOTE ON THE CAGAYANO THEORY OF DISEASE.

THE natives of the Cagayan Valley are very superstitious and believe that all disease is caused by the entrance into the body of evil spirits. In order to get rid of the evil spirits, the relatives of the sick person make a small boat of some fine wood; they place in this boat, money, cigars, betel-nut, a live chicken and some portion of the clothing of the sick person. This boat is then set adrift in Cagayan River in the belief that the evil spirit will leave the body of the sick person and follow the boat to secure the presents. No Cagayano could be induced to touch one of these boats after it is in the river because he would die instantly from the fury of the evil spirits.—MELVILLE A. HAYS, *Contract Surgeon, U.S.A.*



# United States Army Medical School Annual Addresses.

THE MEDICAL PROFESSION IN THE PUBLIC AND  
PRIVATE LIFE OF AMERICA.\*

By CHARLES A. L. REED, A.M., M.D.

OF CINCINNATI.

THE delivery of an address before the Army Medical School, while a pleasant distinction for which I am grateful to the Surgeon General, involves, nevertheless, a responsibility that I approach with conscious diffidence. This feeling of trepidation arises, in part at least, from the fact that, as a professional man engaged however, in civil practice, I find myself surrounded by new conditions that are provocative of new thoughts and suggestive of new problems. Thus, for instance, there comes quite naturally to my mind the thought that the medical profession, wherever taught, avowed or practiced, presents the phenomena of a certain unity, a certain solidarity; but that, as exemplified, respectively, in public and private, military and civil practice, it presents important variations, and finally, that the causes of the variations and the reciprocal relations of the variants must be matters of interesting if not important consideration. This same train of thought, probably in obedience to the law governing the association of ideas, leads to the conjecture that what may be true of one profession may be true, to an important degree, of other professions represented in the national services.

## A QUESTION OF DEFINITIONS.

In approaching this subject it is well, however, to remember, among other things, that this is a day of social evolution; that

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\*An address delivered at the Annual Commencement of the Army Medical School, Washington, D. C., April 5, 1904.

the changes incident to which come with almost revolutionary rapidity; that these changes are characterized, conspicuously, by the segregation of the people into classes or groups, more or less distinct; that many of these classes, or groups, without reference to being learned or otherwise, designate themselves as professions; and that this process has gained popular recognition and official sanction until, as a consequence, it is no longer possible for us to restrict the use of the word "profession" to the original learned callings of law, medicine and theology. On the contrary, we are forced to accept the conventional definition that a profession is "specifically a vocation in which a professed knowledge of some department of science or learning is used by its personal application to affairs of others, either in advising, guiding or teaching them, or in serving their interest or welfare by the practice of an art founded on it."

If, however, it is necessary for us to get new and accurate bearings about the word "profession," it is even more important that we understand what is implied by the "public life" or the "public services," or, more to our own present purposes, the "national services." In general terms, "public services" represent the more or less specific or classified activities demanded by the community without reference to territorial limitations, and paid for either in money, honor or abuse. These services may be restricted to the town, county, state or nation, to the last of which, as represented in the co-ordinate branches, legislative, judicial and executive of the government, these observations shall be restricted.

If, then, as already indicated, professions have become multiplied, and if we are to study them as represented in the national services, it may be well, by way of preliminary survey, to glance at the number of callings that come within the range of our definitions, representatives of which are to be found enrolled on the official register. I confess search is a little difficult and the result is a little surprising. Of course, law, medicine and theology, the parent professions, like the poor, are always with us, and are liable to remain so long as men violate the laws. national and statutory, and thus destroy their present happiness and jeopard-

dize their prospects of eternal bliss. But, in addition, not to pause with the useful and recognized classes of dentists, veterinarians and nurses, there are physiologists, pathologists, paleontologists and pomologists; educators, engravers, entomologists and engineers, civil and uncivil; botanists, biologists and bibliographers; chemists, climatologists and cartographers; architects, accountants and one lonesome solitary agrostologist. Many of these, like the specialty of grasses, are represented by but one, or at most a very few individuals, a circumstance which makes a detailed consideration of each quite impracticable in this connection. We may, however, with propriety, discuss the original learned professions, as the most conspicuous examples, and study their relations to the different branches of the government. Thus, to begin with the law-making power, we find, as nearly as can be ascertained from the Congressional Directory<sup>1</sup> that of the 475 members of both branches of the Congress, the politicians form a solitary and innocent group of but 7 members, while there are 322 lawyers, 2 physicians, and not a single preacher among them. It would seem therefore, either that it takes a tremendous lot of law to hold seven politicians straight, or else that the electorate, seeing, how everything is hopelessly given over to the law, has—quite inconsiderately, I protest—sent its representatives to Washington with small care for their bodies and none for their souls.

The personnel of the judicial branch, is naturally enough, made up exclusively of representatives of the legal profession. The various services of the executive departments, however, represent practically every variety of professional employment. There are lawyers, physicians and surgeons, clergymen, dentists, engineers and others, the statistics concerning whom I have ascertained, on inquiry, have not yet been compiled. These professional men, whatever their number, are, however, the representatives in public life of professions which, according to the last census, numbered, respectively, in the United States, 114,703

<sup>1</sup>The biographical sketches in the Congressional Directory indicate the following composition of the respective branches of the Congress: *Senate*—Lawyers, 53; physicians, 2; merchants, 9; farmers, 1; bankers, 2; politicians, 1; miscellaneous, 22. *House*—Lawyers, 259; merchants, 9; farmers, 11; editors, 10; bankers, 9; politicians, 6; teachers, 5; miscellaneous, 76.

lawyers, 132,225 physicians and surgeons, 111,942 clergymen, 29,683 dentists, 59,975 engineers, of whom 43,538 were classified as "civil" and 14,440 as "mechanical and electrical;" making a total of 446,528 persons represented in the five professions.

#### INTERESTS INVOLVED.

These aggregates are presented to show the magnitude of the interests that are, to an important degree, influenced by the representatives of the respective professions in the various services. This influence is very much more real and far reaching than may be inferred without a careful consideration of the subject. In the first place, professional service rendered the government is the most conspicuous service of its kind that can be rendered to society; if it is efficient the science which it represents is advanced in public esteem; if it is inefficient the entire profession for which it stands is to that extent discredited. It follows, therefore, that professional service to the government is fraught with responsibility, not only for the trust immediately reposed on it, but for the even greater, although indirect, trust represented in the welfare of the profession thus brought to the bar of public opinion. I venture the assertion that it is this consideration, second only to the motives of patriotism and altruism, that prompts the professions—and I now speak more particularly of the medical profession—to approve of the severity of examinations which raises, at least, a presumption of efficiency on the part of those finally selected for the services. Or, to take another example, if a given profession were to accept from the government a lower compensation than that paid to other professions invested with similar responsibilities, the precedent would tend, relatively, to cheapen that profession in private life. The same principle holds true when one profession is denied rank, position or social prerogatives accorded to other professions of similar educational and social antecedents. It follows, therefore, that the professions in private life have a direct personal interest—an interest more practical if not more real than that prompted even by *l'esprit du corps*—in all that affects efficiency of their confrères in public life.

INFLUENCES TO BE CONSIDERED.

Among the influences thus to be taken into account, none, possibly, is of more importance than that of tenure. This, of course, varies in the different branches of the government, elective offices being held for specific periods, while appointive ones are of variable tenure, an increasing tendency being manifested to increase the number of life holdings. The merits of the two systems have long been and still remain subjects of inquiry. There is no doubt that the superiority of the national judiciary, appointed for life, over the state judiciary, elected for definite periods, has been the one influence most largely responsible for the present strong sentiment in favor of life tenure. The excellent results that have been realized through the workings of the Civil Service Commission, such, for instance, as the extension of life tenure to the classified offices, is another salutary influence that accounts, in large measure, for the present high efficiency in our executive services. The fact that a public servant, especially one that is invested with either judicial or executive duties assured of his career, is placed beyond both the whims of the boss and the caprice of the populace, raises a presumption in favor of the faithfulness and disinterestedness of his labors. While this is true, and while I have not the least disposition to question the value of reforms that have taken place and that are still in progress, relative to tenure, I can not ignore certain facts and tendencies which may be said to comprise the other side of the question. Thus life tenure, with promotion based entirely on time service, takes away the stimulus of necessity, and has a tendency to render the discharge of duty more or less perfunctory. There are men, and women, too, for that matter, to whom no greater misfortune can befall than that of an assured future. With them hope becomes circumscribed by regulations, and ambition becomes paralyzed by the certainty of conditions. This tendency, if it were to become dominant, as I am gratified to believe that it is not, would, in the course of logical development, make society the victim of the joint evils of bureaucracy and parasitism. Another tendency, however—one manifested proportionately to the completeness of the individual's devotion to his public duties

—is his increasing incapacity to meet the requirements of a private career. It may be asserted that with ten or fifteen years' experience in the medical service of either the Army or the Navy, the individual, whatever his technical qualifications, if he attempts to return to private practice, will find himself seriously handicapped by unfamiliarity with those social and quasi-political influences that largely determine success. I am advised that the same is true to an extent of lawyers, who have learned to rely on a paymaster rather than a clientele. This represents no loss, however, to the energy of the community if the change in the individual amounts simply in his completer adjustment to the circumstances and requirements of a public career. If, however, they imply loss of interest in prescribed duties and loss of hope in private life and result in attempts to seek refuge in vicious indulgences, the loss is a double one. The greatest loss that a professional man can sustain is the loss of enthusiasm in his profession, while the greatest loss that a community can sustain is the loss of the productive energy of its members. Fortunately, however, such losses as these, I am persuaded, are sustained through the public services only in individual instances. And I have mentioned them here only to emphasize the existence of tendencies on which they are based, tendencies that, in a certain sense, have logical beginnings and equally logical endings.

#### REMEDIAL MEASURES.

Correct, however, as may be a diagnosis, it is of small value unless it leads to the adoption of curative measures for the present and preventive measures for the future. When this phase of the question is taken up one is at once brought face to face with the personal element in the equation, an element that can never be ignored. Nothing can come out of a man that is not in him, be it good or evil, and one or the other will come out of him, according as it preponderates in him. Yet no man is wholly bad, and there is none who is not responsible to an important degree to the stimuli of ambition and hope. Ambition makes him amenable to the *esprit du corps* of his service, which, if high, lifts him to the higher levels of endeavor, but which, if low, will only encourage the development of deteriorating tendencies.

In addition to this it would seem important that those in authority should give to their subordinates the fullest opportunity for the development of individualism, consistent with efficiently ordered discipline; for the strength of any service can best be promoted by promoting the strength of its individual units. Not only is it important to promote individualism, as shown by power of initiative, always, of course, under necessary restriction, but it is almost equally important to concede opportunities for individual reputation. There are few men, I fancy in the services who do not possess, in some degree, that weakness known as the love of approbation, and if there is such an one he ought to be expelled as an unsafe member of the corps. It is, however, important to discriminate between the intelligent appreciation of those whose approval is worth having and the ephemeral praise of the multitudes who, unthinkingly, applaud to-day and cruelly forget to-morrow. That form of approval, however, which finds expression in promotion for cause, is one of the most wholesome sort, while the reverse rule—that of degradation or dismissal, equally for cause—can not but be a corrective agency of great value to those who are not appreciative of good fortune.

#### POST-GRADUATE INSTRUCTION.

Important as are these influences, they do not, however, have a direct bearing on the fact that, in spite of increasing experience there is a tendency to grow unfamiliar, if not actually to forget much that ought to be kept well in mind. This fact has been recognized by both the Army and Navy in the establishment of special service schools. These institutions—such as the Artillery School at Fort Monroe, the Engineer School of Application at Washington, the School of Submarine Defense at Fort Totten, the School of Application for Cavalry and Field Artillery at Fort Riley, the General Service and Staff College at Fort Leavenworth, and the War College at Washington—are intended for advanced technical instruction for the strictly military profession, while the Army Medical School at Washington is designed to give similarly advanced and special instruction for members of the Medical Corps. Similar institutions exist in the Navy. So far as these institutions relate to medicine, they tend to confirm

the fact, already extensively recognized, that military medicine is a distinct specialty of the healing art. This is manifested in the curriculum presented by General Orders, which embraces the topics of (*a*) the duties of medical officers in war and peace; (*b*) military surgery, the care of wounded in time of war and hospital administration; (*c*) military hygiene; (*d*) military medicine; (*e*) microscopy, sanitary and clinical, pathologic histology, bacteriology and urinalogy; (*f*) hospital corps drill and first aid to the wounded.

#### SCOPE, POSSIBILITIES AND NECESSITIES OF THE ARMY MEDICAL SCHOOL.

A mere glance at the foregoing subjects shows that the essential object of the Army Medical School is to adapt medical science to the requirements of military life. The necessity for such a course of study becomes apparent when it is remembered that the curricula prescribed in the medical schools of the country do not, and in the nature of things ought not, to embrace the highly specialized subjects that relate, almost exclusively, to military practice. Such studies are, however, essential for the regular Medical Corps. But when it is remembered that, in times of war, the regular Medical Corps numerically considered, is totally inadequate to meet the requirements of the service, and that, at such trying moments, it is necessary to rely on the medical officers of the National Guard and on volunteer and contract surgeons, the scope and possibilities of the Army Medical School for the proper education of this auxiliary medical service, becomes apparent. Its usefulness would be still further increased if the bill for the reorganization of the Army Medical Service, creating a reserve medical corps, were to become a law. To meet these requirements—to meet even the existing requirements, however—it is simply essential that the Medical Department shall be provided with a large central hospital, strictly up to date, to serve as a clinical school for medical officers and as a training school, alike for the Hospital Corps and the Nursing Corps. A failure by the Congress to provide this means of instruction is simply a blow at the medical service, the efficiency of which is essential to the efficiency of the Army itself. Such a failure when



viewed in the light of the expenditure of millions on millions of the public money for the construction of unnecessary postoffices in un-heard-of towns, and for the alleged improvement of tideless streams, is a species of culpability for which each participant ought to be held to strict account by his constituents.

MEANS OF RECRUITING PROFESSIONAL RANKS IN THE  
NATIONAL SERVICES.

The professions as represented in the national services are variously recruited. Thus, in the legislative branch, they are elected; in the judicial they are appointed, without examination, while in the executive department they are appointed, some with, some without, examination. Whatever may be the method of selection, the new incumbents are drawn directly from the ranks of their profession in private life. I wish to emphasize the word "directly," for it is important, as implying that men thus selected pass, for the most part without intermediate training or experience, from private into public practice. Such a transition, whether in law or medicine, is too sudden to enable the individual properly to adjust himself to the requirements of his new station. It thus becomes apparent that, in every branch of governmental employment of a professional character, some provision, whether by a system of promotions or by the organization of reserve corps, ought to be devised as a safeguard to the efficiency of the service. This is especially true of the Medical Corps, which, at such times as our last two wars, was forced to rely on men who, without reference to their scientific attainments, had never been taught to appreciate nor drilled to meet the peculiar requirements of the service. But, without reference to war emergencies, it would be a vast improvement over the present contract system to create a reserve corps, consisting of men, appointed on examination, who, although not in the service, would be eligible to the Army Medical School, and who, by other means, would be giving serious study to the duties of the army surgeon.

THE QUESTION OF STATUS.

The status of such a reserve corps, whether in the army, the Navy, or the Public Health and Marine Hospital Service, or whether relating to professions other than the medical, should be made definite and need not, in the least, interfere with the status

of any corresponding services, as at present organized. As I have already stated, the present status, particularly in the three services just mentioned, is rendered definite by regulations. These regulations, to the informed and impartial mind, are, in many instances, neither wise nor just. They, however, who have accepted service under them must expect to abide by their provisions. I do not mean to imply by this that men affected by unjust rules, ought not to attempt, by prescribed and lawful means, to remedy the evil. It can readily be understood, however, that if every body connected with the public service were to attempt, by one means or another, to change existing conditions, the executive would be besieged, the Congress would be overwhelmed, and endless confusion would result. It was doubtless conditions leading to precisely such a state of affairs that prompted the general order,<sup>2</sup> by which officers and employes of the government

<sup>2</sup>GENERAL ORDERS,

No. 18.

HEADQUARTERS OF THE ARMY,

ADJUTANT GENERAL'S OFFICE,

*Washington, February 19, 1902.*

The following has been received from the War Department:

WAR DEPARTMENT, WASHINGTON, Feb. 19, 1902.

The following Executive Order has been received from the White House and is published for the information and guidance of all concerned:

EXECUTIVE ORDER.

All officers and employes of the United States of every description serving in or under any of the Executive Departments and whether so serving in or out of Washington, are hereby forbidden, either directly or indirectly, individually or through associations, to solicit an increase of pay or to influence or attempt to influence in their own interest any other legislation whatever, either before Congress or its committees, or in any way save through the heads of departments in or under which they serve, on penalty of dismissal from the government service.

THEODORE ROOSEVELT.

White House, Jan. 31, 1902.

At the same time special attention of the officers of the Army is called to the following existing provision of the Army Regulations:

“Efforts to influence legislation affecting the Army, or to procure personal favor or consideration, should never be made except through regular military channels; the adoption of any other method by any officer or enlisted man, will be noted in the military record of those concerned.” (Par. 5, A. R.)

ELIHU ROOT, Secretary of War.

BY COMMAND OF LIEUTENANT GENERAL MILES:

H. C. CORBIN,

*Adjutant General, Major General U. S. Army.*

were forbidden, under pain of dismissal, to attempt, directly or indirectly, personally or through associations, to promote their own interests.

DUTIES OF THE PROFESSION IN PRIVATE LIFE TO  
THEIR PUBLIC CONFRERES.

While the position thus assumed is, unquestionably, justifiable from a governmental or disciplinary standpoint, there remains, however, another and very serious side to the question. It must be remembered, as I have already intimated, that the professions in the public services are, primarily and essentially, the representatives of the corresponding professions in private life; that the status of the professions in the public services, relative to other professions, persons and classes, will and must be recognized as a criterion of the relative status of the corresponding professions in private life; and that, consequently, the professions in private life, jealous alike of their positions and their prerogatives, must see to it that neither are compromised through precedents established either for or by their public representatives. Recognizing, as has been shown, that the hands of their public confrères are tied by executive restriction, it becomes the duty of the respective professions, in their organized capacity, to take the initiative in correcting any influences which, in a reflex way, may act detrimentally on their own welfare, whether in public or private capacity. When such action can be coupled with unquestionable considerations for the public good, the obligation becomes doubly imperative. But, aside from the altruistic motive, and as a complete justification for intervention, it is to be remembered—and in effect I again repeat myself—that this is an age characterized by the rapid evolution of social groups and classes; that these groups and classes are already jostling each other for place; and that, consequently, that group or class, or, more specifically, that profession must be vigilant and courageous that would guard its prerogatives and conserve its status in a democracy presumably founded on the principle of equality.

Such intervention ought to be undertaken only after careful consideration of all the interests involved. Care should be taken to avoid the tendency to consider the view point of a given profession as the only view point in the case. Representations should be made, whether to the legislative or the executive de-

partments, always with profound respect for the intention of those in authority to conserve all the interests placed in their hands, but with the feeling, the assurance, that the view point of the legislator or of the executive may not be the only view point in the case. Thus, to illustrate, it would seem that a given profession would be justified in making respectful representations to the heads of executive departments, when its representatives in the services are placed in positions of responsibility, without authority to control or determine results; or, when final judgment is passed on the technical knowledge it represents by those who are ignorant of the subject; or when it is ignored in the composition of commissions of mixed membership, dealing in a large way with the practical application of the art and sciences for which it stands; or when it is excluded from consultative bodies on which its skill and position would, naturally, entitle it to representation; or when its technical qualifications are permitted to act as a *bar sinister* to its preferment in any capacity to which its general attainments entitle it to consideration.

In the legislative field, however, the duty of the professions to themselves and to the public are even more distinct. To begin with, each profession owes it to itself to be adequately represented in all legislative bodies, state and national. No profession can complain if it is the victim of inimical legislation, passed during absence from these posts of duty. On the other hand, the professions owe to themselves and to the people certain self-denials in the direction of legislative work. Thus, speaking now more particularly for the medical profession, laws regulating the study and practice of medicine, laws relating to the public health touching such questions as the sanitary reclamation of public lands, the protection of streams from pollution, the protection of interstate commerce from disease-producing agencies, quarantine, the prevention and management of epidemics, the manufacture of drugs, the purity of food and water supplies, need the attention of the medical profession in legislative bodies.

I have discussed these questions in this presence today, because this is conspicuously an institution identified with and representing the largest public interest of the medical profession. You, gentlemen, go forth today as specialists in military medicine. Your careers in the medical schools, where you received your doctorate, your success in passing the rigorous entrance exami-

nations in the Army Medical Service, the splendid records you have made as special students in this institution, commend you to the confidence of the Secretary and to the esteem of your profession. The start you have thus made is accepted as a prophecy of achievements to follow actual labor in the field of your choice. Be assiduous; interest yourselves in original investigations; study the highest efficiency of your service, and in return I am authorized by the American Medical Association to vouchsafe to you the protecting influence of your great profession, whether duty shall place you in the favored spots of our mainland or shall send you to the far-away islands of the sea.

#### THE HIGH MORTALITY AMONG MEDICAL OFFICERS IN WAR.

**A** PROPOS to the Russo-Japanese War the Russian Medical Journal contains an article from which it appears that the rate of mortality among military surgeons was much larger during the war with Turkey than in the combatant portions of the Army. As it was deemed of very great importance to know whether this was peculiar to the late war, a comparison was made with the ascertained losses of surgeons in former wars, and the following statistics are the result of this investigation:

During the campaign in 1813-15 there were 2170 surgeons in the Prussian Army, of whom about 10% was either killed or wounded, being in about equal proportion to the casualties among combatants. In the French campaign against Constantine, 1837, while every thirteenth combatant officer was killed, every sixth surgeon died. This, in proportion to the numbers, shows that the mortality among surgeons ( $16\frac{2}{3}\%$ ) was more than double that of the line officers ( $7\frac{1}{6}\%$ ). During the Crimean war, according to French official statistics, the mortality among the surgeons was  $18\frac{2}{3}\%$  and among the combatant officers  $7\frac{1}{6}\%$ . In the last Russian campaign, 355 surgeons out of a total of 2839 died, being equal to  $12\frac{1}{2}\%$ . In the Mexican expedition (French) the rate of mortality among the surgeons was about 20%, while that of the combatant officers was only about 4%. The only instance on record where the proportion of deaths among combatant officers was larger than that of the medical officers was in the Prussian Army during the Franco-Prussian War, 70-71.

## THE PROSPECTS OF THE YOUNG MILITARY SURGEON.\*

BY THE HONORABLE WILLIAM H. TAFT,  
SECRETARY OF WAR OF THE UNITED STATES OF AMERICA.

**Y**OUNG GENTLEMEN: It becomes my pleasant duty to present to each of you the evidence of your satisfactory year's work, and before doing so, I should like to ask each of you whether he realizes just what kind of a life it is that he is about to enter on.

You are to be physicians and surgeons without the hope of that emolument that will ever make you rich men. When you ask the women who are to be your wives to marry you, you are going to invite them into a life doubtless of high thinking and happiness, but not one of the utmost luxury. You are going to have to calculate during your life how far your salaries will go, to provide for the education of your children, and how much you can save against a rainy day.

Then you are about to become soldiers. Doubtless many of you will have to expose yourselves quite as much as any officers of the line, but you must forego in your dreams and expectations, that martial glory that comes to those who lead battalions and armies to victory. In other words; looked at from the standpoint which I have indicated, your life is to be one of self-sacrifice. And yet, if you consider it from another standpoint, and I have no doubt you do, the life which is before you offers you much. You become the agents of a nation in looking after the health of its army; you are freed from the necessity of that routine work of which so many physicians become very tired at the end of a professional life, in order that they may get money enough to support their families, and you will be given necessar-

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\*Address of the Honorable Secretary of War to the Graduating Class of the Army Medical School, Washington, D. C., April 5th, 1904.

ily, in the life for which you are paid your salaries, opportunities for original investigation and for original discovery.

After an observation covering a number of years, it has seemed to me that there is no profession that evokes from those who follow it the enthusiastic love which pays for the work, like the medical profession. Even a layman can look back over the last two decades and speak with wonder of the advance which has been made in the medical profession for the benefit of mankind; and you have before you the rewards, higher than money, higher than martial glory, which may well come to you from original discovery for which all mankind will be your debtor.

We are hoping to get a medical bill through which I trust will make you all Colonels,—I believe the bill provides forty, and I do not think I count forty before me. But those of you who are content to sit quiet and wait while age comes over you to confer rank will probably not become Colonels,—you ought not to become Colonels at any rate. It is the man who works with the love of his profession, with the anxiety to be doing something in the position to which he is assigned, who ought to come out at the head of the list, and that is the system for which we are working. If you all in this particular class labor to come out at the head of the list, while you may not be Brigadier Generals, you may all be Colonels, and I hope you will.

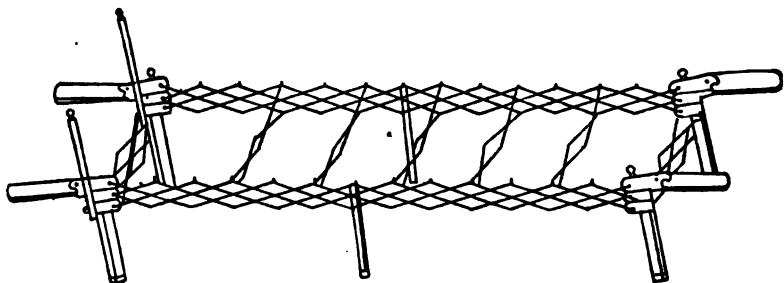
#### AN EPIDEMIC OF DIPHTHERIA IN THE SWEDISH ARMY.

**A**S a result of observations during an epidemic of diphtheria in the Gottland Infantry Regiment in 1003, D. Fischer (*Tidskrift i Militar Halsovard*) remarks that there are two methods of fighting an epidemic of diphtheria in a military command. There may either be (1) repeated examinations *en masse* of all the personnel and the bacilli-bearers isolated and the non bacilli-bearers bathed, provided with fresh clothing and assigned to non-infected quarters or (2) every man may be immunized with serum.—HANS DAAE.

## Reprints and Translations.

### THE VELEDA LITTER.

**D**R. FREULER of Zurich has devised a litter which he calls the "Veleda" litter. It consists of a combination of jointed and extensible metallic trellises. Drawn out it measures 180 centimeters in length and 60 centimeters in width. Folded upon itself it is reduced to a quadrilateral measuring but 32 centimeters high by 33 centimeters broad and 14 centimeters thick and may be easily carried in a strong canvas bag into which



The Veleda Litter. Open.

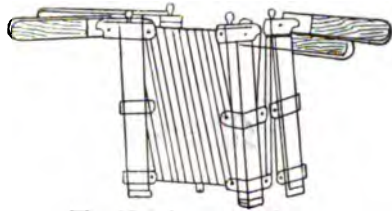
it fits and which will serve as a pillow for the patient. The whole weighs exactly ten kilos and can be carried by a single man without fatigue for many hours. A sheet of canvas extended by the means of single loops attached to buttons forms a hammock upon the metallic trellis, itself more or less flexible by reason of its numerous articulations which produces a certain elasticity considerably reducing the concussion of marching. Entirely constructed of small steel rods the veleda litter combines remarkable lightness with great solidity. The four handles only are of wood.

The appliance has many advantages, the chief of which of course is its easy transportability by a single bearer. Hardly





**The Velede Litter. Packed for Transportation.**



**The Velede Litter. Closed.**

less useful is the small space which it occupies when compressed and packed. An important advantage present in no other litter is its elasticity and the decomposition of jarring forces produced thereby, which renders it especially applicable to use with untrained bearers and peculiarly useful to civilian first aid organizations, where but little time can be devoted to the development of harmony in carrying the disabled.



**The Velede Litter in Use.**

# Medico-Military Index.

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**BREVET BRIGADIER GENERAL THOMAS LAWSON.  
SURGEON GENERAL, U. S. ARMY, -1836-1861.**

## Editorial Department.

### The Surgeon Generals of the United States Army.

#### IX. BREVET BRIGADIER GENERAL THOMAS LAWSON, SURGEON GENERAL OF THE UNITED ARMY.

1836-1861.

THE unexpected demise of Surgeon General Lovell threw the administration quite at sea with regard to his successor. The natural course would have been to promote Surgeon Thomas Lawson who was the senior officer of the medical corps, but President Jackson wished Dr. Henry Huntt who had been a Hospital Surgeon in the War of 1812, to accept the position. Dr. Huntt was a native of Maryland, who, after a brief period of Naval service, accepted a commission as hospital surgeon in the army, and succeeded Dr. Lovell at the Burlington General Hospital. At the close of the war he resigned his commission and engaged in private practice in Washington. Here his efforts were crowned with phenomenal success and he became the leader of the profession and the medical attendant of most of the leading personages of the day including five successive Presidents of the United States. President Jackson after repeated verbal requests that Dr. Huntt assume the surgeon-generalcy, finally wrote him a personal letter formally tendering him the office. This letter was for many years one of the most cherished treasures of the family. Dr. Huntt did not feel justified however in accepting the offer and declined the honor, urging that his old friend and comrade, Surgeon Lawson be appointed in his stead, a request with which the President on November 30, 1836, ultimately complied.

Thomas Lawson was born in Virginia in the latter part of the eighteenth century and upon the completion of his medical studies in 1809 sought an appointment as surgeon's mate in the navy to which he was commissioned on March 11th of that year. Two

years at sea, however, caused him to turn his eyes to land service, and he resigned from the navy January 12th, 1811, and on the 8th of the following month was appointed garrison surgeon's mate in the Army and was promoted to be surgeon of the 6th infantry, May 21, 1813, in which position he rendered most distinguished service during the War of 1812, so that upon the reduction of the Army in 1815 he was retained as surgeon of the 7th infantry to date from the 17th of May of that year. Upon the reorganization of the Medical Department in 1821 he was appointed surgeon in the Army, becoming the senior of his grade and so continuing until his promotion as Surgeon General in 1836.

He early distinguished himself not only by his ability as a medical officer but by his valor in the face of the enemy, being conspicuous among the officers of whom Medical Director James Mann reported in 1814 that "during the investment of Plattsburgh by the enemy the surgeons were constantly passing from fort to fort or blockhouses to dress the wounded, exposed to a fire of round and grapeshot; while the greater part of the army were covered by fortifications. The cool bravery of the surgeons was in private conversation noticed by the Commander in Chief."

He thenceforward enjoyed a most interesting and varied service, participating actively in every war in which the country was involved to the time of his death, with the exception of the operations against Black Hawk, on which occasion he was only prevented from engaging by disapproval of his application for duty with the forces in the field. Like so many medical officers of the army he on numerous occasions acted as adjutant and as quartermaster and was for months at a time in command of a company of the regular army.

When the Seminole war broke out in 1833, he manifested great efficiency and upon the organization of a regiment of volunteers in Louisiana by Colonel P. F. Smith, he was on February 3, 1836, enrolled as Lieutenant-Colonel, in which capacity he served with entire credit until the regiment was mustered out on the 15th of the following May, when he was assigned to duty as medical director of the troops from the north, destined for service in the Florida war, which had been concentrated at Fort Mitchell, Ala-

bama. While still upon this duty, he was appointed Surgeon General in October, 1836, but did not leave the field until the spring of 1837, when he was at once detailed to accompany President Jackson to his home in Tennessee. Upon his return to Washington his assumption of the duties of surgeon general was yet further delayed by War Department orders directing him to organize a battalion of New York and Pennsylvania volunteers of which he was retained in command until May 1838, when he was enabled to take up the direction of the medical department.

His administration of a quarter of a century was one of the longest terms of service in the history of the surgeon-generalcy, but the records of his work are singularly deficient. Colonel Joseph R. Smith, well known as one of the most distinguished of our army medical officers, however, remembers him well and to Colonel Smith's courtesy we owe the personal phase of this sketch.

General Lawson was always loyal to his corps and pertinacious upon all points pertaining to it. This was manifest in the stand which he took with regard to the genuineness of the entrance examination; he had himself been president of one of the first army examining boards and spoke from personal experience when he insisted upon the inviolability of the examination, and by that action fixed the army medical examinations for all time as severe and unquestionable tests of professional and personal fitness for army medical service.

He was ever strong in the opinion that actual rank should be conferred upon medical officers, although it was not until 1847 that on the 11th of February, Congress passed an act in which appeared a clause providing that "the rank of officers of the Medical Department of the army shall be arranged on the same basis, which at present determines the amount of their pay and emoluments," but with the same limitation as to command as now prevails. General Lawson was an enthusiast upon the subject and Colonel Smith more than once heard him speak of the advantage of actual rank for medical officers not only to the medical corps but to the whole army, and he was wont to refer with pride to the purely military functions performed by Roberts, when killed in Mexico, and by Head when leading

troops after Indians in Texas. He was himself, however, prouder of his professional than of his military career, although he naturally regarded his service in the line with great complacency.

He heartily opposed all invasion of the rights and perquisites attaching to the medical department. A noteworthy instance of this occurred in 1840, when new uniform regulations were proposed in which no epaulettes were allowed to the officers of his corps. His argument upon the subject was one of the finest statements of the position of the medical corps ever produced and quite naturally accomplished its purpose. Eternal vigilance was necessary in this matter, as was shown by the fact that when, eleven years later the uniform was again revised, it was proposed to omit the sash, worn by other officers, from the dress of the medical corps. Again General Lawson took the field and again success marked his efforts for the honor of his corps, in the retention of the green sash destined to become so famous in the great hostilities of a decade later.

He too was the subject of attack on the ground of private practice by army medical officers; in this as in all other matters he stood firmly for his corps and in a letter signed by his principal assistant, Surgeon H. L. Heiskell the principle, which thenceforward became one of the canons of the department, was enunciated that "when it does not interfere with their military duties, medical officers have a right to give their professional advice, etc. to whomsoever they please," with the addition that "it is rather desirable than otherwise that the army physician should extend his sphere of action to the citizens immediately around him."

His cordial esprit de corps was especially demonstrated in his report upon the medical work of 1846, when he said that "those gallant spirits led on by Major General Taylor always in the presence of the enemy and frequently in conflict with him, have necessarily afforded ample scope for their exercise and judgement in practical surgery; and the ability which the medical officers have displayed, and the unremitting attention they have bestowed on the sick and wounded soldier (the enemy included) have called forth a willing tribute of respect, and the grateful acknowledg-



ments of all who have experienced or witnessed the results of their humane efforts and practical skill."

General Lawson was a great admirer of General Winfield Scott, whose conduct in the War of 1812 especially pleased him and when both of them in later years were attached to the headquarters of the army, a marked intimacy sprang up between them. Scott heartily reciprocated Lawson's friendship and not infrequently chaffed him concerning his military propensity. It was not surprising then that when General Scott undertook the command of operations in Mexico, he invited General Lawson to accompany him as chief medical officer, a proposition which was promptly accepted. During the campaign, however, Dr. Lawson did not assume the actual direction of the medical department but acted rather in an advisory capacity to Surgeon B. F. Harney, the official medical director of the expedition. In these operations, as always, the words of the Surgeon General with regard to the medical corps on the Rio Grande, were also applicable. They "participated largely in the toils, the privations and the dangers of the field with their associates-in-arms of the line of the army, . . . and it is but justice to say that they have been found present wherever their honor and their duty called them, nobly fulfilling in every particular their obligations to their country." In these distinguished services, Dr. Lawson himself bore a conspicuous part, and received the well earned brevet of brigadier general in recognition of his military efficiency and personal intrepidity.

Upon the cessation of hostilities General Lawson returned to his desk in the War Department and passed the remainder of his life in the uneventful direction of the sanitary work of the army in peace. During this period he was instant in season and out of season in efforts to advance the interests of his corps. In 1850 he inaugurated the custom of official delegates from the army to the American Medical Association. From 1853 to 1855 he strongly pressed the increase of his commissioned force, advocated the enlistment of hospital stewards as such, and urged the authorization of extra-duty pay for soldiers detailed for hospital service, all of which were duly materialized in an act of Congress of August 16, 1856.

General Lawson was rather of an administrative than a literary turn of mind although he wielded a trenchant pen when occasion seemed to demand it. The publications to which his name is attached are the *Statistical Report on Sickness and Mortality in the Army from 1819 to 1839* and a *Meteorological Register for 1826-30*, together with the various official reports of his office, to the actual authorship of none of which he would lay claim.

His service led him up to the very portals of the greatest conflict in which his country had ever been engaged but death cut him off before he could apply his experience and ability to the solution of the mighty problems of the sixties. He betook himself to Norfolk, Virginia in the hope of recuperation but on the 15th of May, 1861, he was stricken with apoplexy and expired within a few hours, thus severing the last link connecting his corps with the War of 1812.

General Lawson had been senior surgeon of the army for fifty years and surgeon general for twenty-five years, his entire service as a medical officer rounding out a full half century, a condition impossible at the present day owing to the age limit. He was conspicuous for his exceptional vigor and energy, which assured for him the respect and admiration of his friends and excited the doubts and anxiety of his opponents. He was a pronounced adherent of "the code" and thought that medical officers should be as ready as those of the line thus to repel and resent insult, believing that much of his success as commander of troops would not have been achieved had not he borne the reputation of being ready at any time to give or demand what was called satisfaction.

He was never married but kept house in the old Andrews mansion in Washington not far from the Winder Building. This freedom from family ties, doubtless left him more at liberty to devote himself to the medico-military subjects which absorbed his entire attention and which he developed to so high a degree of efficiency. His loyalty to his corps and his quickness to resent any imputations upon it secured respect not only for himself but for his department and exceptionally adapted him to the leadership which he maintained for so long a period.

## Reviews of Books.

### THE NEW INTERNATIONAL ENCYCLOPEDIA.\*

**T**HE concluding volumes of the New International Encyclopedia right worthily sustain the standard of the earlier issues. Military and Naval subjects together with topics in medicine, surgery and hygiene continue to be fully represented. Among the more interesting medical features, may be mentioned the articles on the Sanitary Commission, sanitary laws, sanitary science, sewage and sewerage, sleeping sickness, smallpox, typhoid, tuberculosis, vital statistics and water. The military aspect is represented by sections on small arms, smokeless powder, Spanish-American war, staff, torpedoes, and war in general. There are excellent sketches of General Sternberg and Colonel Senn.

It is surprising however to find no sketch of the Association of Military Surgeons of the United States, although other much less important organizations, both military and medical, are adequately touched upon in the text. We regret also to note the inaccuracy of the article on the "Surgeon, Military and Naval." The article implies that there are no medico-military grades above that of Major in the Army and Lieutenant in the Navy and allows only that of Lieutenant to the assistant surgeon of the Army. In view of the fact that a sketch of the army medical school is given in another volume, the statement that, "prior to regular assignment, United States army surgeons go through a five months course at the Army Medical *Museum*," is astonishing. It is difficult to see how more inaccuracies and mistatements could have been crowded into a single article than appear in this, and

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\***The New International Encyclopedia.** Editors: DANIEL COIT GILMAN, LL.D., HARRY THURSTON PECK, Ph.D., L.H.D., and FRANK MOORE COLBY, M.A. Vols. XV-XVII: Imp. 8vo; pp. upwards of 1000 each, with numerous illustrations; New York, Dodd, Mead & Co., 1904.

the editors are urged to correct it in the next printing of the volume in which it appears.

The article on "Surgery, Military" is by Major Louis Livingston Seaman, one of the most efficient volunteer Medical Officers of the Spanish-American imbroglio and distinguished in many directions, in addition to being the founder of the Seaman Prize of the Military Service Institution of the United States,—and is what would be expected from so authoritative a source. We must take exception however to his opening statement that "the best civil have proved the best military surgeons," which is by no means correct. It is possible undoubtedly for the best civil surgeon to become the best military surgeon, but in order to do so he must have been willing to assume the attitude of a learner and acquire by careful study the technical military medical knowledge which the Army Medical School and some years of actual experience give to the medico-military neophyte. The prime object of the Association of Military Surgeons is to impress upon the profession and the public, this very fact, that military medicine and surgery is a distinct specialty and requires special training for its proper practice. In this connection it might be well to correct the impression that exists in some quarters, that the army surgeon lacks the experience of practice, which is by no means the case,—the army medical officer, as a matter of fact has as a rule a larger experience than falls to the lot of his average brother in civil life; and in the military service may be found specialists of the highest qualifications in every department of medicine.

Passing the introductory sentence, however. the article becomes an accurate, succinct and luminous analysis of the subject of military surgery. It devotes itself largely to the discussion of the technically surgical aspect of military surgery, although other phases also receive mention. The author adopts the view of Senn with regard to the first aid packet, and repudiates the triangular bandage as a component. The aseptic character of the small-caliber rifle projectile is noted, and the excellent results obtained by modern conservative and aseptic treatment are brought out. The armamentarium of army field practice is described, and the work of the base hospital specified.

The importance of quick transportation for the disabled is emphasized and the necessity for prophylaxis in the field is dwelt upon. Sanitation and hygiene are brought out in their proper relation to medico-military work and the profound and incessant responsibility of the military medical officer is impressively pictured. The many and diverse lines which the work of the military surgeon follows are well indicated, and the article forms so admirable and lucid a presentation of so important a subject that it can not but add greatly to the value of the great work to which it pertains.

#### VON BERGMANN'S SURGERY. \*

IT has been some years since a system of surgery of this magnitude has been offered to the profession in America, and never before with such a galaxy of names of foreign authorities. The names of the editors and translators are a sufficient guarantee of the high excellence of the contents. In the first volume which treats of the surgery of the head, all references to bacteriology, inflammation, aseptic technic etc., are omitted, the editors believing that the surgeons of today are sufficiently familiar with these subjects, or that they can be found in books treating directly of these topics.

The volume is devoted to the injuries, malformations, plastic operations, anomalies and surgical conditions of the head. Gun shot wounds of the skull and face have received the careful consideration of Surgeon General von Bergmann himself and liberal space is devoted to these injuries.

The book is practical, containing much clinical matter, pathological data and original research. The illustrations are good, but few in number, as compared with recent American treatises.

The work has but few faults and very many strong points that recommend its acceptance by the profession. If the following volumes are as valuable as this one, we bespeak for it a warm welcome.

A. R. ALLEN.

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**\*A System of Practical Surgery.** By DRS. E. VON BERGMANN, of Berlin, P. VON BRUNS, of Tübingen and J. VON MIKULICZ, of Breslau. Edited by WILLIAM T. BULL, M. D., of New York. To be complete in five Imperial 8vo volumes, containing over 4000 pages, 1600 engravings and 110 full-page plates in color and monochrome. Volume I; 936 pages, 361 engravings, 18 plates; Philadelphia, Lea Brothers & Co., 1904.

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